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THE UNIVERSITY OF ALBERTA

INFORMATION AND SOCIAL CHANGE
THE USE OF TWO-WAY TELEVISION

by

© GERALD A. ROYER

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled Information and Social Change: The Use of Two-Way Television submitted by Gerald A. Royer in partial fulfilment of the requirements for the degree of Master of Arts in Community Development.

Supervisor

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R A Pendergast

Date: October 8, 1982

ABSTRACT

The purpose of this thesis is to investigate the impact of computer-telecommunication technology on the functioning and shaping of the community.

An investigation of the characteristics of the "information society" is provided with discussion centered around the emerging technologies which allow interaction to take place and which facilitate the process of development in communities.

With the innovational technology based on the combination of computer and communication technology, the transfer or spread of information and ideas can be further employed to help human minds communicate more easily across the barriers of time and space.

With information becoming a prime force in social change, emphasis is placed on how symbols, myth, and language shape and give meaning to the social fabric of the non-geographical community.

To illustrate and show the impact of knowledge transfer, two examples of two-way T.V. communications are discussed -- the Telidon and the HI-OVIS Project in Japan.

In view of information and communication being an instrument of social change, the concept of community development is explained through the General System Theory.

Furthermore, as some aspects of the changes in social consciousness are antecedents to behavioural changes, an investigation of modern physics and Eastern mysticism, left and right hemispheres, consciousness and System Theory are explored in view of understanding how the processes of information and

knowledge-transfer affect not only individual lives but also social and community development.

As man essentially communicates for the purpose of attaining and giving meaning to his environment, relationships and social bonds alter the very patterns which are adopted in every community as a working and operational model. The continual changes in meaning also alter the function and structure of any community; thus the emphasis of this thesis is on the importance of man's responsibilities, rights, and privileges in bringing about conscious changes which affect his community.

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Gerald Royer
Edmonton, Alberta
October, 1982

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INTRODUCTION

Thesis Overview

Much of the current work being published in communication journals, popular literature, and the media concerns itself with the emerging role of computer telecommunications. Many scholars subscribe to the idea that Western society is in a period of transformation from an industrial to an information society. With the introduction of computer-telecommunications, information is becoming more available and more accessible to more citizens. With the impending development of two-way television, new services provided will have profound impact in the home and community by creating a fundamental shift in the way information is disseminated and retrieved.

Two-way TV is a broadband carrier and receiver which has greater capacity to transmit more varied information selected by each citizen. This capacity to simultaneously provide a variety of information to as many people as possible removes the concept of standardization of information. The more diverse the culture, the more differentiated its technology, energy forms, and people, and the more information must flow between its constituent parts if the entirety is to hold together. As people become more individualized, more information, guides, and cues are needed to predict their behaviour.

A distinctive characteristic of this new period is the progressive need and demand for self-determination and self-government in the families or businesses, schools, governments, between nations and in international movements. People request input into the decision-making centers which originally had been left to a large measure to an "elite" power group. Mass media have reflected the basic requirements of the Industrial Age: centralized capital investment and increased productivity that yield higher surplus value. In effect, only a few individuals actually control, direct and determine what is necessary for the needs of citizens. The oligopolistic nature of the television industry has resulted in very little diversity in programming and a high degree of homogeneity. This environment has created a change in the way we receive information and in the way we are experiencing and understanding the world.

A single information source is capable of speaking directly to the minds of hundreds of millions of people at the same time -- one speaks, millions absorb. In the process of having current mass media programming standardized, imitation becomes a way of being. In Marshall McLuhan's terms, the mass becomes a "mechanical bridge". A decrease of information (variety) means a decrease in the ability to change. The one-way system of communication, such as mass media, has been entropic in nature; the repetitiveness has put the nation to sleep. The impact of the media industry has contributed largely to the malaise of our time.

With social attitudes changing toward self-determination, information technology offers new possibilities not only in terms of hardware but also in providing new avenues for linking human resources with people sharing the same interests and loyalties. Many other components in Maslow's need-hierarchy must also be fulfilled. The holistic person is he who feels and thinks, but it has long been recognized that the affective domain of Western man has been neglected and the emphasis has been on the cognitive areas of education (Bloom, 1964). With the introduction of the two-way system, people may select a whole range of services and information which are conducive towards their attaining a communal understanding of how they wish to meaningfully direct their lives. The one-way video has been selective in determining what aspect of human events will be shown and what impact it will have in the marketplace.

Man, being unique and autonomous, has a corresponding need to exercise autonomy. The two-way video is a new art form with a new language through which we perceive new relationships at work in the environment. It is the beginning of an era of image-exchange between man and man. This exchange of images and information creates energy which in turn becomes wealth when it contributes to the development and self-enrichment of a community. Two-way video, therefore, provides an opportunity for people to achieve greater autonomomy and decision-making and thus better understand how they are to reshape the world in which they live.

Purpose

The primary purpose of this thesis is to explore the potential of two-way television as one sub-system in the larger system of mass communications; as having the possibility of "linking" contemporary man back to the community. This will be accomplished by looking at the potential of interactive television from a community development perspective.

A major development in communication technology in recent years has been interactive, two-way communications services over cable networks. Information utilities bring picture, voice, and text material to the home at the individual subscriber's request. This instantaneous and simultaneous transfer of information reflects the nature and characteristics of the information age. While the technology has facilitated innovative methods of handling information from a one-way medium to two, it offers new opportunities in affecting community dialogue by putting individuals and groups into communication, thus providing them with opportunities to engage effectively in decision-making. In effect, two-way communication becomes one of active instead of passive participatory democracy.

The whole question of the two-way use of TV means, in community development terms, that the participation or involvement of as many people as possible in a process of social change is not only possible but necessary. Roland L. Warren argues that there is an increasing importance in the relationship of communities to the larger societies surrounding them. Communities can properly be considered as significant social systems having distinct types of systemic ties: the relationships through which they are oriented to the larger society beyond them constitute the their vertical pattern, and those that community units share with each other on the local level constitute their horizontal pattern (1977). Communities do have structural and functional relationships to other formal and informal communities; the horizontal ties are those relationships with diverse local units, whereas the vertical are those links toward the planned, rational, bureaucratic system. The two-case study will attest to this. Community development is an effort to help people jointly obtain greater direction over their environment including more satisfactory patterns of social relations and institutions. It is the purpose of this thesis to prove that information offers a stimulus for change. As more information is exchanged through the two-way interactive TV, the alternatives toward social change become greater. If community development people are change agents, the computer-telecommunications technology opens up unlimited opportunities for them to effect change. With the aid of fiber optics and optic technology, face-to-face electronic communications has increased co-operative action. This new tool in a large urban setting will help people communicate more effectively with other citizens in other cities or countries around the world. Truly the Wired City has opened a new door to learning, sharing and understanding. In this manner the two-way interactive television has the capacity of moving our society to an entirely new level of communications.

The Methodology

This thesis will be of a theoretical and analytical nature. Discussion will include current theories in the field of information and will relate them to recent field studies of two-way TV technology in Canada and Japan and its impact on, application, and significance to community development.

The theoretical portion of this study is compiled from numerous published materials. It attempts to describe the development of "interactive" television within the context of the "information society" while at the same time recognizing man's needs for human meaning obtained through symbols.

Given that information exchange is basic to social change, the author argues that a sound development theory on communication is important as it must reflect and assist organizations in undertaking and designing communications networks which include citizen participation. Given that information flow is important in community development, further development for the telecommunications industry in implementing those changes must be with full participation by citizens receiving and giving information to each other with the purpose of bringing about a qualitative change in the community. As one-way flow is dominant in our culture, changes towards a total citizen participation is a slow process. But it must be guided by vision and innovative thinking.

Plan of the Thesis

The thesis is organized in the following way:

Chapter One - introduces the concept of Information Society.

Chapter Two - focuses on how man shapes and gives meaning through symbols, language, and myth.

Chapter Three - explains components and systems of the telecommunications technology. Two case studies are discussed in light of their interactive capabilities and their effect on community building.

Chapter Four - reviews contemporary theories on the role of information and communications in development. The theories provide some outlook on how information systems may be best used in a community by understanding the technical and organizational alternatives within a geo-social political environment.

Chapter Five - discusses the role of information in community development.

Chapter Six - discusses how new models and perspectives (paradigms) offer new opportunities in our understanding the role of community development and its compatibility with the information age.

Chapter Seven - discusses the relevance of interactional conception of community focussing on the importance of dynamics, the process of community and its effect on community building.

Chapter Eight - summarizes the importance of electronic telecommunications in the information society and draws some conclusions as to its importance in community development.

CHAPTER I

INFORMATION SOCIETY

In a Science Council report (Report #21, Strategies of Development for the Canadian Computer Industry, 1973) it is stated:

> ". . . we confront a transformation technology, a technology which gives impetus to fundamental change in human thought and action."

Many futurists and social philosophers, such as Weiner, Fuller, Illich, McLuhan, Toffler, and Kahn, have attempted to predict the consequence of the communication revolution. The mushrooming of available information, the demand for its access coupled with innovations in communication technology (telecommunication and computers) are bringing about a revolution in communication which will have profound impact on the way society is organized and in the way we understand ourselves and others. At the same time, the ways in which we participate in problem-solving situations will, by necessity, see drastic changes. Indeed, the dawn of the "information society" is upon us.

The communication revolution is bringing with it a "Wired City". In practical terms this means that some aspects of the technology will involve not only wires or cable as in the case of telephones, but also the infrastructure for lasers and satellites. In social terms it means a quantum jump in communications technology and a corresponding change in the social environment.

The Wired City or the information society will provide a communication service which will make information available in massive quantities to every citizen by way of individualized two-way information systems. Demand television, information retrieval, computer-aided instruction are but a few of the many services that will surround us in the age to come.

This revolution ushers in new kinds of problems that will emerge from the eventual "marriage" between communications and computers. The Science Council of Canada has recently issued position papers about these very problems as well as the multiple opportunities related to the effects of this growing technology. Publications which reflect these concerns are: Telecommission: Policy Considerations with Respect to Computer Utilities (1971); Branching Out: Report of the Canadian Computer Communication Task Force, Vols, I, II (1972); Privacy and Computers (Department of Communications and Department of Justice Task Force, 1972); Instant World: A Report on Telecommunications in Canada (1971).

This is how Report No. 4 from the Science Council forecasts the wave of technology that is about to sweep Canada. "The computer industry will play a major role in shaping the society of tomorrow." This prediction is rapidly becoming reality in 1982 as we witness the development of word processing devices (i.e. "smart" typewriters), high speed facsimile, new storage technology and retrieval systems which can be installed in homes, banks, educational institutions at costs which allow a whole new class of activities to be undertaken.

So rapid is the growth of the information society that new technology becomes obsolete within about three years after it is put on the market (or at a turnover rate of 20%-25% a year). (Financial Post, 1979, 1)

The impact of information revolution represents a new ethos in human civilization. The impact will be pervasive -- it will be seen by how and what we produce, how we transact business, how we pay, how news is gathered and spread, where we work and what kind of work we do and how we communicate. Whereas the industrial revolution made available and employed vast amounts of mechanical energy, the information-electronics revolution is extremely sparing of energy and materials.

The technology of communications will no doubt continue to evolve and with this will come new societal demands for yet more sophisticated technology. The decision on what hardware will be developed and exploited first will depend to a large extend on current investments, available services, and predictions of consumer demand.

The rate of acceleration in the ease and speed of transmission of communication has led communications expert Gordon Thompson of Bell-Northern Research Lab in Ottawa to conclude that ". . . the new information technology will be greater in impact than the industrial revolution." (1978, 10)

As communication technology advances, the computer industry is being forced to segment its operations thereby reducing its power of monopoly over information services. In a recent report Telecommunications and Canada, the Consultative Committee suggested that the "content of a message be distinguishable from the means by which it is carried" (1979, 14). Those who own a cable, for example, would not exercise any authority over the content that is transmitted through it.

This distinction makes it possible for agencies, institutions, and citizens to have freer access to these facilities in a way that allows them to provide and obtain information which is best suited to their needs.

Private monopoly control of the means of communication on a national scale has long been the case in Canada. Even the access of C.A.T.V. to citizens has historically not been to the citizens' advantage. In effect there exists what Harold Sackman argues ". . . the concentration of information power embodied in mass communication utilities." (1971, 248)

All of this, of course, will demand that society clearly define the new relationships it will have with this "Information Society". John McHale has summarized the challenge facing our communications-dependent society in the following way to clearly and comprehensively evaluate the consequences of public responsibility -- or irresponsibility -- in managing the developing of the means of communication.

> "What the new information environment actually does is to set the consideration of issues and approaches to problems in a quite different context. It is one in which we cannot tackle one issue, one question or one problem at a time as isolated items . . . in which the perturbations of one component in one subsystem can grossly affect other components in ways that are quite different from the predictable behaviour of any isolated part of the system." (McHale, 1973, 327)

Through the Wired City's capacity of two-way communication, opportunities for full public participation in the decision-making process will be enhanced. One of the feature characteristics of the information society, therefore, is that the public will have greater opportunity to exercise its full rights in determining its own destiny.

Harold Sackman has suggested that:

> "In a democracy, the public is the ultimate source of social power, and information power, accordingly, is ultimately a public trust. A public philosophy of information power needs to account for new democratic forms and procedures bearing on the organization and equitable distribution of social information." (1971, 248)

In human terms the rapid advances in communication taking place can greatly extend connections between individuals in a community and government. In the introduction to its Green Paper on Computer/Communications Policy, the Canadian Government argues that this new technology can be viewed as a resource-showing system. This is a commodity quite unlike any other, closely allied to the concept of intelligence. In fact computer/communications systems could be regarded as mechanisms for both multiplying the human intellect without definable limit and extending it in space and time.

The electronic communication is a new nervous system which can expand and receive human meanings which help in the process of ego-consciousness of every person. By increasing the quantity and quality of communications between individuals, each person redefines him/herself in a more extended way. The bounds of what is considered "self" are inevitably expanded.

In the true sense of Teilhard de Chardin, the electronic media will be a "facilitative tool" in unifying human consciousness in an implosive and explosive dimension.

Harold Sackman writes:

> "The international information utility may be the first technological embodiment of Teilhard de Chardin's noosphere. The many publics around the world would have an unprecedented

> opportunity to evolve through a major social mutation -- the transition from the historical tradition of passive impotent spectators to active constructive participants and on a responding spectrum of social affairs." (1970, 161)

This new "form" of electronic nervous system provides a better outlet for the release of energy which now becomes more and more directed. Any basic change in the consciousness of human beings calls for a process of "transformation" -- a process of metamorphosis.

The electronic nervous system established a new quality of relationship. Its dimension exists almost endlessly and the modes of existence are infinitely varied, each calling for a different approach. It will provide the opportunity for people to understand themselves and the world around them in a new way. Improving our quality of life is the ultimate goal.

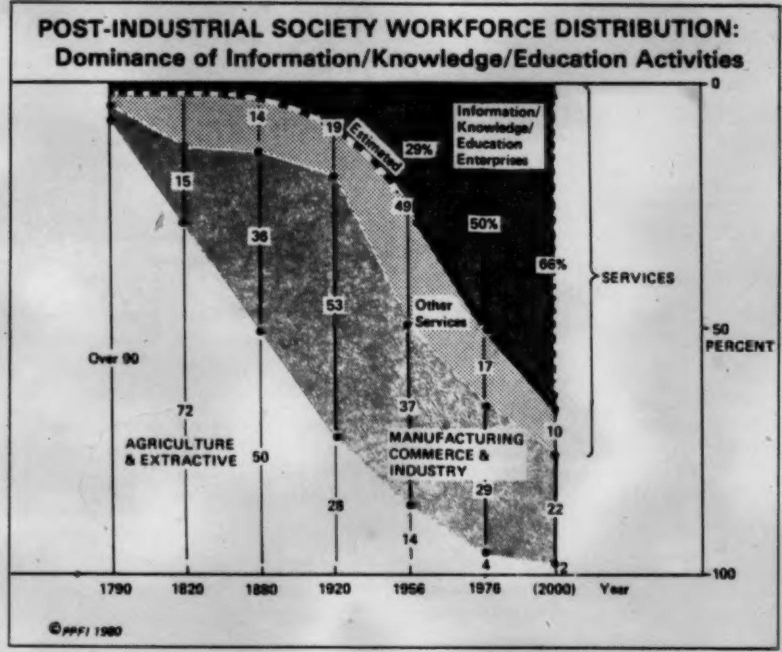
The information society is a new type of societal technology, quite unlike any of the past. Its substance is information, which is invisible. In the past, the transformation of society has been largely concerned with physical productivity brought about by a change from the feudalistic economic system based on agriculture production to a freely competitive goods economy based on industrial production. This view of a quantum leap of production from an industrial base to a computer base, changing not only the content of production but also its societal structures, is strongly emphasized by Yonezi Masuda of Japan. This societal shift is indicated in a number of ways. Edwin Parker says,

> "the U.S. is now in the midst of a transition from an industrial society to an informational society. He (Edwin Parker) points to shifts occurring in the components of the national income statistics

> and changing trends in personal consumption to illustrate this notion." (1976, 130)

Graham Molitor also says that the distribution of the work force is far different now than it was in 1920, for instance, when 53% of the work force was employed. In that year, 28% of the workers were engaged in agriculture and 19% were employed in information, knowledge, education and other service enterprises. By 1976, only 5% were engaged in agriculture, 29% in manufacturing, 50% in information and 17% in other service occupations.

> "Economically, politically, and socially, the importance of manufacturing is fading fast. By the year 2000, a mere 2% of the American work force will work in agriculture, 22% will be in manufacturing and 66% will be allied with information. Graph below illustrates those trends." (Molitor, 1981, 24)



The distribution of workers in different sectors of the American economy changed dramatically over the last century, as society evolved from agricultural to post-industrial. Some important turning points were 1880, when 50% of the workers were in agriculture; 1920, when about 50% were in manufacturing; and 1976, when more than half were in information industries.

(Futurist, April, 1981, p.24)

What appears to be significant in entering this period of societal and technological tranformation toward an "information society" is that "information systems" have become the axial forces in the social change process. As many different kinds of innovational technology come together to constitute one complex system and with its rapid expansion of new types of production, the socio-economic patterns alter in new ways in order to suit the adjustive changes. For instance, we now see in the emerging paradigms in science and social sciences, indeterminancy, complementarity and changes as basic descriptions of nature. These principles operate not only at the phenomenological level of our everyday realities and in our observance of nature but also to modes of knowing which correspond to different levels of consciousness.

With all countries becoming economically and ecologically interdependent, the old gods of isolationism and nationalism are tumbling. Moreover, our personal identity is intimately related to the level of consciousness from and on which we operate. Therefore, a shift in our mode of knowing results in a shift in our basic sense of identity. As a result of the increasing breadth and depth of identity this brings about fundamental changes in human values, trends of thought and the political and economic structures in society. (Masuda, 1981) For instance, an insurrection or crop failure in a distant country can signal change in our daily lives.

Science has given us insights into wholes and systems so we face new frameworks for problem-solving in every area. What may be the most important paradigm shift of all is that we are looking to each other for answers. Individuals are learning to trust -- and to communicate their change of mind.

The basis for the post-industrial society is that the production of information will be the driving force behind the formation and development of society. Past systems of innovational technology have been concerned with material productive power, but with current computer-communications technology, the focus is on "brain power" as opposed to "muscle power". With the use of two-way mass communication utilities and computer technology, new social links are made. Ideas are exchanged, shared, and sold.

Some of the basic values of modernism have also come to be questioned. While there is still a deep split between the "establishment" -- made up of economic and material growth-oriented power groups, and the counter culture -- made up of youth groups, environmentalists, anti-nuclear groups, and human potential enthusiasts, the mainstream of industrial society itself has begun a cautious move toward post-modern values. In the U.S., for example, polls taken by Gallup, Roper, Harris, Yankelovich come up with some surprising findings: (Skolimowski, 1980, 282)

- living with basic essentials. By a margin of 79% to 17%. Americans wish to stress "teaching people to live with basic essentials" over reaching a higher standard of living.
- living a more austere life. 55% of the U.S. public thinks that "doing without something" or living a more austere life would be a good thing.
- non-material experiences. By a margin of 76% to 17%, Americans would rather learn to get pleasure out of non-material experiences than satisfy their need for more goods and services.

- more human, less materialistic values. By a respectable 63% to 29%, the people of the U.S. would rather learn to appreciate more human, less materialistic values than find ways to create more jobs for producing goods.

Seven characteristic features of the information epoch brought about by the technology (computer-communications) will bring about social and economic change. These features give us an overview in which the elements and dynamics of community development operate. The "Information Society", or the new Gestalt, is the context within which the theoretical and practical application of community development can be viewed. The seven areas are:

1. Changes from Industrial Technology to Information Technology.
2. Stages in the Development of Computerization
3. Information Space
4. Time-Value: New Concept of Value
5. Information Utility
6. Globalism -- Neo-Renaissance
7. Education Permanente

1. Changes from Industrial Technology to Information Technology.

Essentially industrial society is represented by volume consumption of durable consumer goods or realization of heavy mass consumption centering around material production. Information society, on the other hand, is represented by information stressing nonmaterialistic values. Daniel Yankelovich writes

> "in the past, people were motivated mainly by earning more money, adding to possessions, gaining economic security. Increasingly throughout the 1970's new self-fulfillment motives

> have gained in importance. People still want material rewards but no longer feel that it is necessary to give so much of themselves to achieve them. People want self-fulfillment in addition to financial security. They desire more personal freedom, more time off, more self-expression, more flexibility, more variety and more opportunity. In essence, they want to assert ever-greater control over how they live their lives." (1980, 197)

The transformation of society in the past is the result of innovations which have always been concerned with physical productivity. Current innovation stresses new self-fulfillment motives as something different from material success. In effect, the stress is towards a life-style built around the principles of "voluntary simplicity" while at the same time generating a more conserving society with a greater balance than now exists between consumption and nonmaterialistic values. These attitudes and values represent a large shift in the traditional North American ethos and philosophy of life. Information for personal growth and a better quality of life requires new kinds of information services and structures for people to use. A change from an industrial and consumptive economy means a shift away from a economy based on materialism.

The prime innovative technology at the core of development in the industrial society was to substitute for and amplify the physical labour of man. In the information society, "computer technology" substitutes for and amplifies the mental labour of man. Information utility (computer-based public infrastructure) consisting of information network and data banks will replace many factories; the leading industry will be the intellectual industries (knowledge industries); the factory will be replaced by the information goods which become societal symbols.

2. Stages in the Development of Computerization.

The four stages of development in computerization are based on the use of computers at the levels of:

a. big science,

b. management,

c. society, and

d. the individual.

a. Big Science

Development of computerization took place in the period between 1945 and 1970. During this time, the computer began to be used extensively in the national scale projects. For example, the U.S. took the lead and used it extensively for SAGE (Semi-Automatic Ground Environment System) protection against missile attack and for the Apollo program in space.

b. Management

This stage, extending from 1955 to 1980, was unlike stage one in that it moved to management-based computerization of both government and business. As the U.S. led the way through the SAGE program, big business made extensive use of the technology.

c. Society-Based

Society-based computerization has been advancing since 1970, with many of its applications being applied to a wide range of social needs. At this level, the general public has a major role in the application of computerization. National and local governments generally are responsible to determine policy. For example, new medical systems, such as medical care systems for remote places and regional health management systems, are currently used. As for the educational system, a knowledge network will become another tool in the type of education services available one which will place the emphasis on learning appropriate to the skills and abilities of the individual student. Examples such as the Telidon with TV Ontario, or the Athabasca University in Edmonton or the Plato system are examples of the "Knowledge Network" emerging for the purpose of servicing the public. (Bowers and Cioni, 1980, 13)

d. Individual

The fourth stage of individual-based computerization is made possible by size, cost, the invention of integrated circuits, and increased capabilities. This stage between 1975 to 2000, will give each person the opportunity to use computer information to resolve problems and to pursue the new possibilities of the future. The ready availability of information and knowledge will cause creativity to flourish. At this stage there will be a personal terminal in each household which will be programmed by each individual rather than by large organizations.

3. Information Space

By information space, we mean the use of computer information spatially, referring to the range of a computer information network. Three descriptive forms of information space are:

a. limited space,
b. regional-national space,
c. global space. (Masuda, 1981)

a. Limited Space

Refers to restricted use of the computer by a business enterprise, government, or a household with the core technology advanced no further than the computer.

b. Regional-National Space

Refers to the range of information network by which enterprises, government organizations, local government and individuals carry on mutual exchanges and shared use of computer information. The computer must be combined with communications circuits. Examples include SAGE, TSS (Time Sharing Services) for business, Plato System, CATV, Telidon, Qube, etc.

c. Global Space

This stage has already begun with the back-up systems for the Apollo Program and ERTS (Earth Resources Technology Satellite), which is proving to be particularly effective in the search for underground resources. Many American multi-national corporations have begun to operate their own global management information systems.

PEACESAT (Pacific Education and Communication Experiments by Satellite) is an experiment in implementing an educational information system in the Pacific Basin. At an individual level, computerization has already begun to take place for a range of personal purposes but appears to have more possibilities in the near future.

4. Time-Value: New Concept of Value

"Time-value is the value which man creates in the purposeful use of future time." (Masuda, 1974, 230). Man designs a goal on the invisible canvas of his future and goes on to attain it. Time is an intangible, abstract concept, but if conceived of as a person's lifetime, can be used for the satisfaction of wants, thus creating a value.

The development of information through computer communications technology has given rise to a new basic concept of time-value. The first point is the increased effectiveness of purposeful action. Computer-communication technology makes it possible to mass-produce logical and action-selection information as well as forecasting. As a result, the effectiveness of purposeful action is greatly increased. This change in the pattern of action tends to place more importance on time-value, or the effective utilization of time.

The framework of a time-value system includes three factors: subject, field, and process. Time-value becomes clear only when seen in this framework. As for the subject, this may mean an individual or group of individuals engaged in social action with some purpose. As for the "field", this is the "space" within which the subject acts with conscious purpose. This field may be geographical or information space.

Information space is referred to as a network of information. It does not have boundaries like a territorial field and the objective-oriented actions are related to each other through information networks. Information space is more abstract in that ideas are the focus. Action is directed from those ideas which result from a time reference. As for "process", this is the development in time of the interaction between purposeful action on the field (geographic space and/or information space) and the reaction of the field. The dynamic process of a system comprises both the subject and the field. The result of an achievement produced by three factors -- subject, field, and process -- is precisely time-value which is a measurement of the result achieved or the point at which the process ends. The situational relationship (process, field, and subject) goes on changing, shifting, and developing continuously.

This time-value corresponds to the satisfaction of human and intellectual wants, whereas material value corresponds to the satisfaction of physiological and material wants. It may be said that the increase in productivity of knowledge-oriented information is the only motivating force that can directly heighten time-value.

5. Information Utility

The information society will be formed and developed around the production of information utility. What is an "information utility"? It is an information infrastructure consisting of public information processing and service facilities that combine computer and communication networks. From these facilities, anyone, anywhere, at anytime will be able easily, quickly, and inexpensively to get information which is wanted. (Masuda, 1978, 45). The following requirements will be essential to an information utility.

a. Central facilities equipped with large scale computers will be able to do information processing and provide services for a large number of users at the same time.

b. Information process and service facilities will be provided for the use of the general public, for which purpose the computers will be connected directly by means of a communications circuit to terminals in business, schools, and homes.

c. Any user will be able to call the local centre of the information utility to have data processed, or process the necessary data for himself.

d. Cost of the services of the centre must be low to enable the general public to use the centre for day-to-day needs.

There are at present two examples to support this claim. One is the experiments on community information systems (HI-OVIS of Japan), and the other is the development and application of the Video data systems in the United Kingdom (Prestel), France (Antiope), and Canada (Telidon). Video-data systems allow users telephone access on demand to information stored in computers, which is then displayed on television sets.

Information utility will take the form of an information infrastructure. It is then necessary for the information utility to become indispensable to the support, development, and maintenance of socio-economic activity, as information is what bonds social networks and communities together. This requires massive investment in equipment and facilities which can be linked in a local, regional, or nationwide network.

Second, the information utility, by its nature, provides a medium to process and transmit information. This service of handling information as a product is unique in character. Information is self-multiplicationin that is is:

i. Non-consumable -- information remains however much it is used.

ii. Non-transferable -- as information is transferred from A to B, information still remains with A.

iii. Indivisible -- information can only be used as a "set". It cannot be divided.

iv. Accumulative -- information cannot be consumed or transferred, so it is accumulated to be used repeatedly. The quality of information is raised by adding new information to what has already been accumulated.

This means that the production of information combined with utilization is a combined operation. It means that the production structure of information bears close relationship to information quantity accumulation and qualitative improvement. In other words, the accumulation of information leads to further accumulation of information which in turn means still further accumulation of information over time and space.

6. Globalism -- Neo-Renaissance

What will be the concept characterizing the thought of the times in the information society? Globalism. The characteristics and content of this "neo-renaissance" will differ from the earlier renaissance in two ways. First, the neo-renaissance will be an era of implosion. The old territorial frontiers that divide mankind are breaking down, a fact illustrated by the shortage of natural resources. Particularly noteworthy is the growing shortage of fossil fuels and metals, such as petroleum, copper, lead, etc. The Club of Rome reports that, even if industrial production is raised and material wants are increased, industrial production "will sooner or later level off because of shortages of raw materials." (1976, 167)

A second characteristic is the idea of symbiosis, the awareness or the mutual interdependence of mankind and nature. This has been exemplified by the pollution problems resulting from enormous industrial productivity; large quantities of industrial and consumption wastes are seriously harming nature and causing environmental disruption. The appearance of pollution and other damage to nature has led to the new science of ecology.

The third characteristic is the concept of global information space (GIS). As distinct from conventional geographical space, this means space connected by information networks. It is space without regional boundaries. When this information space is expanded to global proportions, it will be global information space, formed on the basis of a global information infrastructure of communication lines, communication satellites and linked-up computers. In the global information space, three types of management of information utilities are involved: "business, government, and citizens." (Masuda, 1981, 79).

7. Education Permanente

In Boulding's terms, we are encountering "post-civilization". This has to do with the rapid transformation of social fields in a direction of greater complexity, uncertainty, and instability from the point of view of the purposive social behaviours of individuals, groups, and organizations.

The explosive rate of progress in science and technology has accelerated rates of technological and social change. World population growth accounts for dramatic changes and demands for resources. Rapid expansion in knowledge, speed, volume, and distance for the transmission of information has created a new "social field". The acceleration of change threatens the adaptive capacities of individuals and institutions. Toffler describes this phenomena as "future shock". When changes of this order affect large and populous nations, it inevitably does so unevenly, with the resulting danger of parts of the field being left behind while others advance adaptively to new lifestyles.

The meaning and relevance of education itself is brought into question in light of these major changes.

Current Trends in Education

The climate for educational policy-making is increasingly supportive of radical reorientation, and there are growing numbers of small-scale experiments in new ways of making learning possible. Many new concepts of education are entering public awareness -- "free university", "open university", "extended university", "de-schooling", "school without walls", "community college", "learning exchange", "learning network", "lifelong education" and so on.

The UNESCO publication, Learning to Be, the report of a commission led by Edgar Faure, writes about the radical reconsideration of the future of education:

> "Education is overreaching the frontiers which confined it in a centuries-old tradition: Little by little, it is spreading, in time and space, to enter its true domain -- that of the entire human being in all its dimensions, which are far too vast and complex to be contained within the limits of any "system", in the static, non-evolutional meaning of the word. In this domain, the act of teaching gives way to the act of learning. While not ceasing to be taught, the individual becomes less of an object and more of a subject. He does not receive education as if it were a gift or a social service handed out to him by his guardians, the powers-that-be. He assimilates it by conquering knowledge and himself, which makes him the supreme master and not the recipient of acquired knowledge." (1972, 161)

The view is that the direction of the learning society is becoming a condition of national and global survival. We may refer to our present circumstances as the "ignorant society" -- a society in which the types and levels of skills, attitudes and knowledge lag very seriously behind the requirements of a highly sophisticated, fast-reacting society.

Despite dramatic expansions and changes, the feeling among ordinary people in their private lives, at work, in the community, or in politics (local and national) is that they are in fact becoming less able to control their own life experiences. This feeling implies that "educational" efforts should be oriented towards the needs of individual learners, with the aim of enhancing the capabilities of every individual to select his own life experiences and to manage his own affairs to the greatest possible extent. Jim Bowman argues,

> "the concept of life-long learning has come of age. In the 1980's education will be class-generational, as people of all ages strive to develop new skills and development. The problematique that society faces will require everyone to become more interdisciplinary -- rather than specialized -- in their knowledge." (1980, 328)

The role of the educators becomes that of aiding in the identification and formulation of goals, extending the range of accessible means (resources) and directing those learning experiences to chosen goals. The challenge for educators will be to make a shift from a reactive to a proactive, reconstructionist position and to take a united, professional, global stand on the future of schooling. This is consistent with Illich's conception of a good educational system.

> "A good education system should have three purposes; it should provide all who want to learn with access to available resources at any time in their lives; empower all who want to share what they know to find those who want to learn from them, and finally, furnish all who want to present an issue to the public with the opportunity to make their challenge known." (1971, 75)

The active development of mass, lifelong education has to concern itself with the variety of social responses, so the place of continuing education changes quite significantly. It must seek to create new structures to provide for cooperation and joint endeavour, and to help design the means for people to be able to stay in touch with the opportunities and uncertainty of their worlds without being shattered by it.

For either adaptive or innovative learning, information and knowledge become essential in adjusting to change. Learning becomes a survival tool and for this reason l'education permanente truly takes an active and interventionist role directing new energies in regions of the life cycle (child, mother, father, worker, unemployed, healthy, aged, handicapped, etc.) for human development purposes.

Conclusion

There will be a quantum leap in the way information is processed and transmitted in the information society. The development of the computer-communications technology has created an invisible information network creating an "information space". This means communities extending beyond the geographical boundaries. Those views shared by philosophers, scholars, scientists, and theologians see the "Wired City" as the global village. New facilities allow citizens to have access to and input into the two-way communication, allowing their democratic rights to be better exercised. Many alternatives are available, meaning that community workers have greater responsibility in making the citizens aware of a hidden untapped potential. Social change in the Information Age means -- Education Permanente, making relevant and meaningful information assist in adaptive and innovative change. As the major social impact of computer-communications technology will be the increasing emancipation of man from labor for subsistence, this will have an immeasurable social and psychological effect. Free time for rest and play, learning in the broadest meaning of the word and the involvement of more people looking for a better life could become positive social results of the information revolution. We can allow the communication revolution to develop as simply another extension of the technological world-view with its associated features of control, alienation and standardization, or we can recognize that ultimately communication is a human process and we can devise and develop technology so as to augment, rather than stereotype, the talents of the individuals and citizens.

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CHAPTER II

SYMBOL, LANGUAGE, MYTH

Victor E. Frankel in Man's Search For Meaning writes:

> "Logotherapy focuses on the meaning of human existence, as well as on man's search for such a meaning. According to logotherapy, the striving to find a meaning in one's life is the primary motivational force in man." (1963, 154)

Man's search for and creating of meaning is done through the channels of symbols, language, and myth. Through these media, human experience and information arise from the social interaction of people, and are given expression. The purpose of this chapter is to focus specifically on the functions of symbols, language, and myth in the seeking, finding and giving of meaning. The channels continue changing in expression; meaning is articulated in that it takes on a cultural format in which people's thoughts, desires, feelings, and knowledge are transmitted and understood. At the core of these channels are the group and individual identities on which a network of communications system is established and upon which a community is created, maintained, and grown. The two-way video is an example in which human interaction is expressed through a telecommunications system which links people over distances simultaneously and instantly. In other words, as human interaction increases, more symbols and language systems are exchanged through the electronic system. Because of the telecommunications system's capacity of handling more information through symbol and language systems, a significant new role emerges from the electronic network. As a result of more sophisticated systems, it is easier for people to communicate over long distance and select individuals or groups of people with whom communication is desired. Due to the increasing exchange of information through the channels of symbols, language and myth, the electronic media has made us aware of the significance of the role of the channel system. As information creates and links people in new configurations through the assistance of two-way video, the process of socialization and diffusion of information unifies the human community in new ways. The need to understand the significance of symbols, language, and myth has been highlighted by many historians, linguists and social psychologists. With the constant inflow and outflow of video information, man's relationship to man changes in quality and reshapes his social order and he acquires a wider vision of who he is in the context of the Information Age. Human identity can no longer be exclusively associated with a particular set of symbols, language, and myth. In the exchange of human meaning, the vehicles of exchange also take on new meaning and are capable of expressing new levels of human meaning.

Symbols, language, and myth are like a telescope which provide new opportunities in probing and expanding our knowledge of man. Telecommunication in essence has brought us to a new awareness of the scope and importance of human communication as a necessary link in creating new human communities in the Information Age.

The need to understand systems of symbols, language, and myth is important in that it gives us new insights into the structure of the human mind while at the same time due to man's multi-level of meanings, the human spirit must be understood as operating from many facilities at the same time. Because of the new dimensions in telecommunications, which may allow more facets of the mind to take expression, video can play an important role in "pulling out" hidden human resources.

Symbol

The symbol is to the social world what the cell is to the biological world and the atom to the physical world. Each is the basic unit of a given universe, the social, biological or physical. Quite literally, the symbol is the beginning of the social world. As Leslie A. White puts the matter:

> "All human behaviour originates in the use of symbols. It was the symbol which transformed our ancestors into men and made them human. All civilizations have been generated and are perpetuated, only by the use of symbols. It is the symbol which transforms an infant of Homosapiens into a human being. Deaf mutes who grow up without the use of symbols are not human beings. All human behaviour consists of, or is dependent upon, the use of symbols. Human behaviour is symbolic behaviour; symbolic behaviour is human behaviour. The symbol is the universe of humanity." (1949, 22)

A symbol, following White, is simply "a thing, the value or meaning of which, is bestowed upon it by those who use it." (1979, 25). Meaning, then, is not totally intrinsic. Meaning arises from as well as sustains human interaction. When we examine the nature of the social bond, we immediately see the importance of symbols in human interaction.

Symbolic interaction is the unique form of interaction or communication characteristic of the social life of homo sapiens. Because human beings have a capacity for symbolic interaction, as Herbert

Blumer states, "there is a process of interpretation between stimulus and response." (1969, 79). That is, we do not respond directly to another action, but rather to the meaning we ourselves attach to that action. The fact that man lives in a universe, not only of things but of symbols, indicates the difference between "biological values" and "human values." Science, ethics, and religion become part of his whole culture through symbolism; he is a biological organism at the same time he is a creator of symbols. These unique faculties are inherent to him. (Bertalanffy, 1955)

Human behaviour not only involves reactions to outside stimuli, gratification needs and "equilibrium" with the environment, but also includes the creative element (Karl Buhler, 1959). At the social level, increasing the meaninglessness and emptiness of life has become a psychopathological factor. Gratification by self-rewarding activities, and not mere gratification of basic biological needs, has heightened our awareness of man's symbolic motive or drive toward "self-realization" with some orientation and satisfaction. Any suppression or threat to this activity leads to an increase of mental disorders (Goldstein, 1940; Opler, 1956).

We may say that man is a symbol-creating, symbol-using, and symbol-dominated animal throughout. (Cassirer, 1944; Langer, 1976) Symbolic activity is one of the most fundamental manifestations of the human mind. Consciousness externalizes itself through the medium of symbols; the invisible becomes visible. With automation and telecommunication, human meaning is communicated at instant speed to other people. Thus with the two-way video, automatic involves "feedback". That means introducing an information loop or circuit which brings a further weaving of individuals and groups into an organic system affecting employment, security, education and politics. At electric speed, the symbol (or contained meaning) is shared instantly while with the use of feedback a response is created. Thus the impact of the instant communication of the symbol establishes a global network or a field where all kinds of impressions and experiences can be exchanged and translated. With the development of telecommunication, we have established a growing network similar to our central nervous system which enables us to react to the world as a whole. Also, in the process of increasing symbolic exchanges, new kinds of interrelationships are created at electric-speed as meanings are created instantly. Many scholars have emphasized the process of symbolic activity of individuals, whereas media studies have emphasized the significance of the process as it applies to the designing and creating of social network. Media studies have emphasized the collective nature of symbolic activity and its implications in the growth and development of community development.

Some Characteristics: Discursive and Non-discursive

In addition to the symbol being a vehicle and having the functions of expression, elicitation and representation into the "objective" social world (Langer, 1953, 26), Carl Jung describes this objectification activity as being preceded by a psychic process present in the mind (1953); on the other hand, Cassirer's The Philosophy of Symbolic Forms (1953-1957), argues that symbols are not only creative functions of the individual mind, but also of cultural concern. Out of the "libido or psychic energy", symbolism is channelled through the ego and developed in close interaction with several fields of cultural activity. Cassirer demonstrates how the categories of space, time, number, ego, and existence slowly emerge in interdependence with language, myth and science. "Each language follows a different method of building up its system or categories." (Cassirer, 1953-1957, 271).

The psychic process or "libidinal energy" transfers from the biological to the symbolic level in thought and language. Through symbol, the creative libidinal energies are "packaged and transferred" or containerized in some shape determined by the culture one lives in. Thus symbols are individually and collectively created, always bearing an individual and social imprint. The way symbols are shaped may be discursive or non-discursive. The discursive mode refers to digital in communication theory while the non-discursive symbols refer to the analog (Wilden, 1972, 155). The digital mode of information transmission involves discrete elements or quanta of energy or an image; they represent quantities of units. On the other hand, the non-discursive category (analog) represents the second realm of symbolism which is much harder to approach and for which Cassirer and Susanne Langer have laid some of the groundwork.

> "There is an unexplored possibility of genuine semantics beyond the limits of discursive language. This logical "beyond" which Wittgenstein calls the "unspeakable," both Russell and Carnap regard as a sphere of subjective experience, emotion, feeling and wish. The study of such products they relegate to psychology, not semantics, and here is the point of my radical divergence from them. The field of semantics is wider than that of language. (Langer, 1948, 70)

These, in contrast to discursive symbols, may be referred to as experiential or existential symbols. Although it would require much more explanation than is possible here, it would appear that whereas the discursive conveys facts, non-discursive symbols convey values, emotions and motivation. These values are in general human values, that is, values that transcend the biological values of maintenance of the individual and survival of the species. Man's search and need to communicate provides not only the basis for the individual to seek out his role in life but also for the society as a whole to function. Symbols play a significant role in the communication process as they are "links" which tie human consciousness together. This bridging is manifested in telecommunications in that as the telecommunications systems increase their capacity to expand and link more people together, they take on a major role as catalyst for social change. That is why the information society, as discussed in Chapter One, is such an important change from the industrial society; more symbolic exchange, which is unique to man, is a prerequisite for the knowledge industry to grow. Additional uses and exchanges between citizens accentuate the unique role of man in the process of information exchange.

Cassirer's The Philosophy of Symbolic Forms (1953-1957) is fundamental in the field of symbol analysis. This work concerns the form of symbol rather the the content of symbolism. Whereas Carl Jung has put more emphasis on archetype material present in the content of symbolism, symbolic forms according to Cassirer are creative functions of the individual mind and culture concerned. The symbolic forms comprise not only those of "reason" (discursive) that is, everyday and scientific cognition, but all activities characteristic of the human mind and culture, including language, myth, art, etc. They are not simply "given" for every human mind but they develop in close interaction with cultural activity. According to Kubie, symbolism arises at three psychic levels: "the conscious, the pre-conscious and the unconscious" (1953, 74).

In other words, symbols play a major role in linking man to the world and its culture. As Ernest Cassirer states:

> "That symbolic thought and symbolic behaviour are among the most characteristic features of human life, and that the whole progress of human culture is based on these conditions, is undeniable. But are we entitled to consider them as the special endowment of man to the exclusion of all other organic beings? Is not symbolism a principle which we may trace back to a much deeper source, and which has a much broader range of applicability? If we answer this question in the negative we must, as it seems, confess our ignorance concerning many fundamental questions which have perennially occupied the center of attention in the philosophy of human culture. The question of the origin of language, of art, of religion, becomes unanswerable, and we are left with human culture as a given fact which remains in a sense isolated and, therefore, unintelligible." (1944, 29)

The symbol thus viewed as "a vehicle, to link, or connect" comes from the Latin word -- tessera -- two halves whose fitting together serves as a token of recognition or password. The verb "sumballo", the etymological source of the word, implies a link (Wilden, 1972, 32).

This link provides connection of men's thoughts with the world. Cassirer states:

> "No longer a merely physical universe, man lives in a symbolic universe. Language, myth, art and religion are parts of his universe. They are the varied threads which weave the symbolic net, the tangled web of human experience. All human progress in thought and experience refine upon

> and strengthen this net. No longer can man confront reality immediately; he cannot see it, as it were face to face. Physical reality seems to recede in proportion to man's symbolic activity advances. Instead of dealing with the things themselves man is in a sense constantly conversing with himself. He has so enveloped himself in linguistic forms, in artistic images, in mythical symbols or religious rites that he cannot see or know anything except by the interposition of this artificial medium. His situation is the same in the theoretical as in the practical sphere. Even here man does not live in a world of hard facts, or according to his immediate needs and desires. He lives rather in the midst of imaginary emotions, in hopes and fears, in illusions and disillusions, in his fantasies and dreams. (1944, 25)

Thus it is through symbol creation and manifestation that man can not only interpret his world but also understand it and thus continue to transform it because of consciousness radiation or need for psychic objectification. In this sense, the symbol is the object, exterior to us, which awakens innate knowledge through the senses. This creates our intuitive knowledge of consciousness recognizing the breadth and depth of our subjective world as well as our social and physical world as being the collective extension and concrete interface of human consciousness in social and physical systems.

Thus, the symbol must always be considered as a relationship. The expression or form creates a synthesis of energy. The ability of man to regenerate symbols in quantum leaps is manifested in all physical and social cultures. Carl Jung argues that the increasing complexity of the world is a reflection of an increasing and unified "self" and psychic unity seeking growth and fulfillment (1974, 115). Through the centre of "energy-self", the evolution of culture is enhanced by new technologies. But this is to say that the regeneration of symbols is by nature culturally defined and shaped.

This provides for society as a whole to function and unifies its members by means of "symbolic exchange". Joseph Campbell in The Marks of God: Creative Mythology writes:

> "For we move -- each -- in two worlds: the inward of our own awareness and an outward of participation in the history of our time and place. The scientist and historian serve the latter, the world, that is to say, of things "out there" where people are interchangeable and language serves to communicate information. Creative artists therefore communicate directly from one inward world to another, as an effective communication across the void of space and time from one center of consciousness to another. (1968, 93)

Symbols also provide an avenue for the mythogenetic zone (psychic energy) to be untapped and through the medium of art communicate the artistic, affective dimension with those "out there".

Symbols have a variety of functions but also operate at many levels of meanings. Royce (1965) has emphasized "one-to-many correspondence". as a basic characteristic of symbols. Whereas signals are one-to-one correspondence, signs have universal meaning. Royce's contention is that discursive symbols ("signs" in Royce's terminology) show one-to-one correspondence, i.e. mathematical formula; whereas non-discursive symbols provide one-to-many correspondence (for example, the same dream may represent different entities with a variety of meanings).

Thus it appears that the relations between symbol and represented entity are highly complex and cannot be reduced to a single formula. The spectrum of meanings range from the simple to the complex where we find the greatest geniuses -- from the prophets in the Bible, to Sophocles, Dante, Michelangelo to great minds of our time.

It is the nature of the symbol to unify and incorporate new values, aspirations and visions that provide not only the basis for the individual to seek out his role in the world but also to see himself in a larger historical picture and even cosmic level. R.A. Schwaller de Lubicz in Symbol and the Symbolic explains that the symbol is the experience of our consciousness, the consciousness of the human microcosm through which we are all jointly bound. (1978, 84)

In such a synoptic view, which in many respects is related to that of Cassirer, myth and language mark the beginnings of differentiation between subject and object. With progressive evolution, this differentiation becomes increasingly established when the representative functions of symbols are achieved in language, art, science, myth, and technology. This in various "modes" covers every culture but is achieved differently in each of them. In the post-industrial society, Alvin Toffler speaks of the "future shock" or that process of cultural differentiation which must take place in order for man to view himself as separate as well as linked into the information culture. Due to the nature of the continuous process of symbol creation in man, man's need to transcend the boundaries of time, space and culture also brings into picture some significance of the power of symbols. The higher level of non-discursive symbolism is that of culture, art, poetry, music, morals, religion, vision, and so on. As this was previously referred to as "existential symbolism", one will at least come near to what is meant by adopting Maslow's term (1959) and saying that these are forms of representation and communication of "peak experience". In the ultimate "existential" experience, even these symbols prove inadequate. The mystic as well as the transcendental meditators know that symbols have their limits to explain, express and describe various levels of "peak experiences."

Indeed Von Bertalanffy's (1962) view of a human as an animal symbolicum permeates many of his writings. The quests of space and global communication are not only achievements of science and technology, but are the fulfillments of a long history of man's creating symbols first expressed in Daedalus, and a vision anticipated by utopions from Leonardo da Vinci to Goya and Jules Verne.

Myths, on the other hand, emphasize what symbols do not provide. Myth plays a necessary role in contemporary society as it gives a holistic picture and meaning to why man does what he does. It explains the purpose of his actions. Myths provide a context for all symbols to be unified in some significant way in order to give order and harmony to life.

Language

Language can be considered from a variety of standpoints: the physiological basis of speech, grammar, form, and mechanics; cross-cultural variation and the like. Social psychologists tend to focus on language especially as it relates to other forms of behaviour. Pavlov (1927) is instructive in this respect. He noted that human language represents a "second signal system". Like Mead, he insisted that human linguistic behaviour has special features -- primarily in the human capacity for symbolization. The Bergers (1975) carried this notion to its logical sociological conclusion. They imply that language is the fundamental and indispensible process giving rise to social facts by arguing that language not only makes social institutions possible but that it also, in fact, is an institution. In other words, language serves as a mechanism for bringing people together into instances of collective behaviour (Wharf, 1956).

At the same time as language systems establish patterns and networks for conveying and receiving information, they are limited by a particular culture or group in society. In other words, language is both an "open system" as well as a "closed system". As language connects people, it also sets them apart. For example, not only does each society have its own native tongue but also any number of subsections or social worlds. Social classes can be differentiated by speech differences (Schzatman and Strauss, 1955) and different cultural elaborations. Special languages then are important for what they indicate concerning self-conceptions, the meaning of events and the boundaries of groups (Shibutani, 1961). Language functions as a network between members of a society; at the same time it reflects the need for individualization of people, it expresses different levels of meaning because of symbolism-creating in man.

This is also reinforced when Benjamin Lee Wharf in Language, Thought and Reality suggests that every language plays a prominant part in actually molding the perceptual world of the people who use it:

> "We dissect nature along lines laid down by our native language. The categories and types that we isolate from the world of phenomena we do find there . . . on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds -- and this means largely by the linguistic systems in our minds. We cut nature up, organize it into concepts, and ascribe significance as we do, largely because we are parties to an agreement to

> organize it in this way -- an agreement that holds throughout our speech community and is codified in the patterns of our language. The agreement is of course, an implicit and unstated one, but its terms are absolutely obligatory; we cannot talk at all except by subscribing to the organization and classification of data which the agreement decrees." (1956, 49)

What is indeed important to note is that language not only brings people together for meaningful purposes, but it also influences ordinary every-day activities from personal to cultural levels. In other words, it affects behaviour. Language gives meaning and also defines groups from each other, thus creating more and varied kinds of communities.

Count Korzybski stated in his early book, The Discovery of Man, that man is endowed with a "time-binding" faculty which seems to be lacking in animal species (1977, 9). This concept of group and sub-group language boundaries creates a dialect process by which new language is created. The process continues and the need for creating meaning also evolves into a new cultural-whole (Rudhyar, 1977). Edward T. Hall in Beyond Culture writes: "Language is not only a system for transferring thoughts or meaning from one brain to another, but a system for organizing information and releasing thoughts and responses in other people." (1976, 49)

Language also reflects the plasticity of responses and the infinite varied arrangement of symbols put into a "whole". Chomsky argues that the process of "put together" is the inventiveness of human behaviour (1957).

Levi-Strauss (1962) in particular spells out the function of language as a vehicle to convey content. Language conveys messages distinct from its own structure. This limiting of language is a result of meaning operating through symbolism beyond the signification of words. Meaning transcends the here and now, and thought having affective and intuitive signification must use a system of myth in order to anchor and explain unverbalized aspects which language is limited by. These limitations of language partly explain through myths man's own mystery and the profundity of his being.

Myth

Levy-Bruhl in Primitive Mentality views myth as a product of human consciousness characteristic of any age (1966). In a similar vein, Karl Jasper views it in a historical-social context when he states:

> "Mythological thinking is not a thing of the past,
> but characterizes man in an epoch." (1958, 15)

In broad terms, myth is a story which is taken to manifest some aspect of the cosmic order. Usually religious symbols and images are combined in narratives known as myths.

At this juncture, we find support among figures such as Mircea Eliade (1958), and Paul Ricoeur (1970) who have found it necessary to affirm myth as a distinctive dimension of human thought. Another leading authority is Joseph Campbell. In Hero With A Thousand Faces (1962) and Myths to Live By (1972, 13), he argues that religions have essentially provided archetypes giving meaning and purpose to the mysteries and unknown dimensions of life. He forces us to see the common denominators we all share because of the myth-making process, and concludes that man must see himself as part of the larger family and allow this knowledge to be used in fulfilling human potentials. According to Campbell, a myth should do at least four things:

1. Instill a sense of awe with the mysteries of the universe.
2. Understand the world with scientific knowledge of the time.
3. Support the social order through rites and rituals.
4. Guide the individual through the traumas of living.

Myth in effect is the cornerstone in providing meaning to the mysteries of life, meaning which is achieved by and through others. It is not an individual effort, it is communal. Our existence is in reality a coexistence. The phenomenologists like Merleau-Ponty (1968) and other existentialists have assisted in focusing on sharing the importance of social relationships as the center of meaning-giving. Social cooperation, makes for greater freedom; the greater the cooperation with others, or the greater the socialization, the freer the individual is in projecting himself in sense-giving activities.

This sense-giving according to Jung (1953) results from mythological images which are already present in every person. Through archetypal images showing up in dreams, fantasies, daydreams, imagination or hallucination, hidden meanings are revealed. By integrating these new meanings into consciousness, there expands qualitatively the notion of a self which is a sense-giving centre. For Carl Jung, myths are the projection of inner psychic dramas, but these in turn are products of the "collective unconscious". In this sense, myths have a psychological function which is highly significant in personal and social life in that it endorses particular ways of ordering experiences and acting in daily life. In terms of social functions, myths promote the integration of society. They are a cohesive force binding a community together, contributing to social solidarity, group identity and communal harmony. They encourage cultural stability, for they are an active force related to almost every aspect of culture (Mead, 1934). Ernest Cassirer holds that myths are based on an authentic intuition of the solidarity and continuity of cosmic life-ends by asserting that the age of mythical consciousness has been superceded by the scientific age.

The significance of myth provides a world view. The present is interpreted in the light of events narrated in myth, as Mircea Eliade (1958) has shown. Peter Berger (1967) refers to this ordering of experience as "cosmizing", the adaption of a world view to give a framework for human life.

Probably what is most signficant to myth is that it informs man about himself. It expresses the continuity between the structures of human existence and cosmic structure and somehow explains some aspects of one's own mystery in an intuitive way.

In essence, myth provides a meaning which explains birth, death, purpose of life, destiny and gives meaning to one's self-understanding. This understanding links one beyond the bounds of social, political and economic systems. As social structure and experience change, new myths will be needed to explain one's identity in light of new social environments.

Gerald A. Larue in Ancient Myth and Modern Man provides a schema which divides myths into six basic categories. They are:

> 1. Cosmological myths suggest cosmic order and meaning. Such myths explain how the world and all that is in it came into being.
> 2. Societal myths or myths of social identification give order and structure to particular groups. They define group limits and explain why varying social levels exist within a city or nation. They provide divinely ordained acceptable norms of conduct.
> 3. Identity myths or myths of personal identification enable individuals to understand their role as human beings. Such myths often concern a hero figure who symbolizes man in the search for identity.
> 4. Eschatological myths deal with the end of an age and the end of time. They incorporate such matters as life-death-resurrection, future rewards, punishments, reincarnation, etc.
> 5. Death of God myths discuss the death of one, several, or all gods. They may even become symbols of mythic disassociation, or human alienation from mythic structures.
> 6. Discussions of future myths are said to provide a basis for thinking about mythic patterns that may be emerging now in our society and to project what mythic themes may become dominant in the future. (1975, 21)

Obviously, there will be overlap, for example, societal patterns may be implied in cosmological mythology. Actually all myths are identity myths, because they relate to human efforts at self-understanding and appreciation of the relationships of the self to the world.

In contemporary times, myth continues to pervade the consciousness of man. One way is through heroes of the mass media, artists, people with social status or people with whom relationships are a source of inspiration, growth, development, and meaning. Through the medium of electronic technology, image-making and distribution has been increasing incrementally. Perhaps with higher technology of the future, the flow of images may be directly translated into the electronic media. Ira Progoff in Depth Psychology and Modern Man strongly argues that:

> "the psychic of man is a flow of imagery. The imagery of the psyche is constantly in movement. Imagery moves on all the various levels of the psyche and in a variety of forms. Derived from the deepest recesses of the psyche and from the collective corners of the self; cosmic and transpersonal meanings through imagery are given expression. Once surfaced and objectified the self is extended in new ways in the physical and social world. Streams of consciousness connect, link the personal subjective world to the objective world by giving it significance." (1973, 154)

If man electronically projects images of the mind into the cosmos and experiences a "Gestalt" sense and unity with all what is, then what would be the purpose of new myths?

Conclusion

Symbols, language and myth are unique attributes of man. Energy-minds seek to be expressed in order to communicate. In the process of exchange, the electronic technology may further assist in the utilization of the two-way flow of information which affects the quality of relationships within or between a social environment. Social change is precipitated by the use of these "channels" as a medium of defining and expressing human meaning. As symbols, language, and myths are not only a means to understand and express being but are also modes of being, they incorporate information of the pre-conscious element of human consciousness. In particular when symbols, language, and myths are expressed through images, information which cannot be reduced to conceptual abstractions is apprehended intuitively by the right side of the brain. Those images become one of the important forces in holding communities together while at the same time accelerating changes in interpersonal communications and relationships.

The definition and classification of symbolic activity of man does not imply that it is an isolated function. In a general sense, symbols, language, and myths are the manifestation of psychic energy, more particularly associated with the affective aspects of behaviour.

Indeed, as symbols, language, and myth are understood to be "freely chosen", "representative", and "transmitted" in a particular culture, this specifically permits us to distinguish human psychology and behaviour from subhuman activities. We may say that social change is due to symbolic activity. Furthermore, as society or culture is the construction of "patterns and connected symbols", "myth and language", social change may be then also viewed as the creation of new symbols. As other functions of symbol, language, and myth inject new meanings, new relationships are developed. Events and experiences collectively have a range of meanings in which, through symbolic activity, human relationships are unified, bridged, connected, and made whole again. As telecommunications become part of our daily experience, the communications system becomes part of our culture. To some extent, the telecommunications industry and related social activities define new roles and jobs as well as create new opportunities in the human quest for knowledge and meaning. The communications environment becomes part of our symbols, language, and myth which become part of our psyche while at the same time our need for self understanding and interpretation continues. The telecommunication technology is only significant if we acknowledge some of the characteristics of the human mind which seek to unify and make connections. Through the two-way video system, the process of symbolic activity is extended instantaneously to more people, emphasizing in the process man's need to be better understood. With the assistance of two-way communications and feedback loop information, new information is made available, thus extending the quality of human relationships through symbols, language and myth. Chapter V discusses the role of community development from a non-geographical perspective. Again this view becomes part of our myth in that man is situated in a larger social context than what he was previously aware of. Chapter VI explores why man's self image is broadening in scope and meaning. As the social context of man broadens, symbols, language, and myth help to unify man to a broader context of the information society discussed in Chapter I.

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CHAPTER III

DEVELOPMENT OF TELECOMMUNICATIONS

The rapidly growing world literature testifies to the fact that we are passing through a technological revolution which will transform society as radically as did the industrial revolution. This post-industrial revolution is characterised by the emergence of "knowledge" industries based on electronic technology. Emphasis is moving from the production and distribution of material goods towards the assembly and distribution of information.

The first part of this chapter briefly describes some of the components that go into the assembly of computers in general. Since mass media utilities are the infrastructure of the information society, any technological changes and new development occurring at the micro-level also has social impact. In light of the brief exposé of the hardware components designed into the computer technology, the second portion of this chapter will focus on the Telidon and HI-OVIS as examples of emerging technology for social purposes in the information society.

Communication Technology

1. Uses and Capabilities

We live in a communication society and a communication world. At home, in business, in the car or airplane, we are exposed to and depend on many forms of electronic communication. The importance of communication to and from offices and homes becomes increasingly evident upon realizing that communication can substitute for transportation and thus save energy and lower pollution.

People travel to work or to school or business trips to participate in activities that might well be conducted at home or office terminals through the use of interactive television. Two-way communication can eliminate the need to be present physically at a place of work. While communication technology may be a desirable alternative ecologically and from the standpoint of conservation, for the citizens it must be expressed in terms of the services it can offer (Lapp, 1978, 84). But the services possible depend on what systems are available: the telephone, television, video players, and so on. In turn, systems are made up of subsystems and components, so there is a hierarchy of technology which assembled in an appropriate order, provides the communications infrastructures. A brief look at Components will elaborate on these communication infrastructures.

Integrated Circuits (ICS)

The integrated circuit is one of the most important and universal components; it is a basic building block in modern electronics. It is a complete electronic circuit containing such subcomponents as transistors, diodes, resistors, and capacitators contained within a tiny chip of silicon. They are small in size (one-sixteenth to one-eighth of an inch square), of low cost and high reliability. Like all circuits, there are two classes of ICS -- switching and amplification. It is common to refer to a switch as a gate. Small-scale integration (SSI) have up to 9 gates; medium-scale, from 10 to 100 gates; large scale from 100 to several thousand gates (Barron, 1979, 65).

Fibre Optics and Lasers

Huge volumes of communication traffics (phone, TV traffic, telex) have traditionally used copper wire for transmission purposes, but these circuits are running short of capacity. Fibre optics, using light for transmission, offer the possibility of carrying a considerably greater number of messages within smaller space constraints. As light possesses an inherently larger capacity for handling information, each fibre is capable of handling roughly one thousand telephone conversations or several TV programs. Communication systems using fibre optics rely on lasers as a prime light source for transmission (Hiltz, 1978, 404).

Charge-Coupled Devices (CCDS)

Charge-coupled devices are semiconductors which promise to become a low-cost alternative memory in computers, microprocessors, and video storage. For example, RCA has developed a CCD television camera with a TV screen resolution of 525 lines -- the standard for North American sets. CCD cameras are low in cost, small in size (a few pounds) and are ideal for field use production of network quality (Lapp, 1977, 86).

Mini-Computers

Modern communication systems use mini-computers to control the flow of traffic, route messages, perform logic, control functions, and store data. (The term mini refers to physical size and cost, not to computational capability.) The mini-computer consists of a central processing unit and a memory unit.

Micro-Processors

Surrounding the mini-computer there is often an array of peripherals: communication links, keyboards, cathode ray tube displays, large memories and data banks, and control actuators. Micro-processors provide the interface between the micro-computer and its peripherals serving as the communication traffic cop, setting priorities and directing the flow of messages (Martin, 1977, 322).

Micro-Computers

Although similar to the mini-computer, the micro-computer differs in that it has built-in units that are capable of performing up to 400,000 operations per second. It is revolutionizing electronics and communications. Its applications in the communications industry have barely begun, but, nevertheless, it has had a major impact in its designing, application and entry into a market place where it is becoming a convivial tool for every citizen.

Systems

An overview follows of the present telephone network, satellite communication, computer communication, vertical internal transmission, and cable systems which link the national and international network.

- Telephone

In the future, under the control of a computer, electronic exchange will perform the switching electronically. Phoning to Africa from Alberta is now a nightmare, but more devices are coming into the market. For example, there is the "call waiting" service; when someone tries to call you while you are using your phone, a signal is heard, you can suspend your current conversation for a few seconds and check out the new caller. Other devices will enable you to have all calls forwarded to another number when you go out for the evening.

The existing telephone is being used in new ways in conjunction with the television set. Microwave technology is enabling telephone companies to add many thousands of voice channels to existing long-haul systems by satellite.

- Satellite Communication

Today, virtually all Western World Communication satellites including Canada's ANIK series are synchronous or geostationary, orbiting at 22,400 miles over the equator. There are twelve transponders on each ANIK Satellite capable of carrying an equivalent of 960 one-way voice channels on one colour television channel. In light of the increasing international traffic flow, satellite capability is increasing in the services it can provide, such as direct signaling to every home or every person through a receiving system built into watches.

- Computer Communication

The present data systems, using what is called packet-switching, represent a radical departure. Information is "containerized", with each carrying instructions about its destination. The computer packages information into a "standard packet"; the address is read by the packet-switching exchanges which are actually mini-computers. The packets are forwarded over a high-speed telecommunications link to the next exchange over the best route available. This provides signals from the sender (headend) to a specific subscriber in a network. No longer is it necessary for corporations, companies, and community groups to have a privately-based line for some twenty years and exclusive rights for the services on a particular line.

- Vertical Internal Transmission (VIT)

Many techniques have been developed for the insertion of extra communication signals within the television signal. Such communications can consist of printed pages or captions, extra audio channels, special test signals and alerting signals. This system is more popularily known as the Vertical Blanking Interval (Martin, 1977, 146). For Canadian TV, there are 525 lines per frame at 60 frames per second. Thus every sixtieth of a second there is a vertical blanking interval, that is, there is an "open space" interval. About one third of the blanking interval is technically available for special signals. The VIT signals take the form of digital data which have to be removed at the receiver end by an appropriate adapter. This is an example of how the Telidon (Canada) operates, as the data takes the form of information panels or pages that could be displayed on the TV set. Two systems have been operating in the United Kingdom since September 1974, known as CEEFAX (BBC) and Orode.

- Cable Systems

Today over 50 per cent of all Canadian TV homes (3.3 million) are connected to cable. Growth in the number of subscribers has been at the rate of 25 per cent per year. The first rural cable or CATV (Community Antenna Television) system in Canada started in 1950 (Lapp, 1978, 96). Canadian cable television has become a world leader in terms of growth, saturation and stability. The Canadian Radio, Television and Telecommunications Commission (CRTC) has maintained a strong regulatory hand on the growth of Canada cable television. According to CRTC policy, CATV system must give priority to Canadian network signals, independent Canadian stations and locally-originated programming, including educational broadcasts. The entire revenue of cable systems comes from subscribers' charges.

In 1978, there were 425 authorized cable television systems in Canada (Lapp, 1978, 97); ten operators in Toronto alone. Premier in Vancouver was the largest cable system in Canada with 175,000 subscribers, next was National in Montreal (1965,000), third was Rogers in Toronto (165,000) (Lapp, 1978, 78).

Cable systems obtain their signals off-the-air from huge antenna. Cable licensees distribute their basic service to subscribers' twelve-channel TV sets -- the so-called VHF channels. When these channels are fully utilized, further channels can be added by the licensee: nine mid-band and fourteen super-band channels.

The additional channels can be received by the subscriber by purchasing or leasing a converter, which, when attached to his TV, may provide up to twenty-three extra channels.

The next step beyond the present converter is pay TV. Essentially pay TV provides the subscriber with first-run movies and major sporting events without advertising, on a charge-per-program basis (e.g. $5.00 movie). One type of pay TV system uses special channels wherein the signal is scrambled at the headend and sent out on one of the channels to all subscribers. Those subscribers with a descrambler can reconstruct the signal for normal reception. The cable operator charges extra for the descrambler or he may monitor and regulate its use on a per program basis.

The next step in cable television technology is the one-way addressable system with frame grabber. A headend address encoder can address each home terminal individually. It operates on the same principle as the pocket-switching network described earlier. The request for service from the office or home must be transmitted to the headend via the telephone line. For example, in the case of catalogue shopping, the subscriber would request certain pages to appear on the screen.

Two-way interactive cable television signals from the subscriber to the headend usually take the form of keyboard commands and responses. Downstream and upstream signals are designed. Computers are needed at the headend for any two-way system which might perform a variety of functions (Baer, 1971, 5). In a more complex role, the computer responds to subscriber-initiated requests. This permits the subscriber to call up data and graphics stored in the headend computers (catalogue), register an order to buy and have it acknowledged (shopping), provide simple numerical commands to a data base (travel, theatre, and restaurant reservations), and call up specific programs for special purposes (education). Also by adding a transponder, utility meter reading can be done remotely (Godfrey, 1980, 83).

The frontiers of computer technology are shifting constantly as computers proliferate in many directions at once. The high-speed electronic computer is perfecting towards the ultimate limit of molecular information storage with high speed-of-light transmission (Dertouzos, 1981). Present trends are towards a pluralistic and open information service. The incredible diversification of information sourcing and inputing raises the challenge of improving innovative learning. The capacity and influence of TV has been immense. Programs such as "Sesame Street" have been so successful at stimulating early learning that at least 50 countries have incorporated many of its ideas. Due to the technological change and opportunities, the role of TV has begun to take on new dimensions. Test and field trials are currently being done to test TV potentials for the improvement of social knowledge (Marvick, 1979, 167). As a general statement, the two-way mass media is new in its technology, while at the same time it has redefined the learning experience of people and has changed some behaviour.

As technology changes the social context, social effects become part of the social process. As this process is vital to the sharing of information with and among people, we are therefore concerned with what happens to individuals and groups in the learning process (UNESCO, 1975, 150). Since learning affects attitudes, skills, and knowledge, the manner in which the media processes and transmits information to people is critical (Roberts, 1979, 66).

2. Current Uses of Two-Way Mass Media Systems

For the purpose of briefly looking at two different kinds of "mass media utilities" using two-way communication (Telidon, HI-OVIS), we should first look at Masuda's four stages of information utility development (1980, 77-78). This will help to decide what the stage of development in computerization, utilization and popularization of computers in society is and from this, to forecast possible outcomes. Phases of interactive development are:

a. Public service
b. User production
c. Shared utilization
d. Synergetic production and utilization

Public Service

This is the stage at which the information utility provides information services for the public. Many kinds of programs and data bases are prepared by the utilities in advance. Videodata and Telidon systems belong to this stage.

User Production

The user of the information utility produces information. The user collects data, makes the program and makes use of the information utility to produce the user's own required information. Factors to promote user-production of information are: 1) that one's own information be produced for oneself, 2) that development of language programs be an easy and conversational mode, 3) that development of program modules be done, and, 4) that a data base be set up to suit many different fields.

Shared Utilization

Information utility makes possible the shared use of information produced by individual users. As the production of separate information by individuals reaches a certain point, the data and programs are registered and become available to third parties, and shared utilization interacts to produce a geometric effect.

Synergetic Production

Production of information by a group belongs to this stage. The shared use of information by individuals develops into voluntary synergetic production and shared utilization of information by groups. There will be more complex programs that will only be possible when several people work together. This phase probably represents the highest level of "interactive" system in terms of the four phases described.

In view of the four phases of interactive development suggested by Masuda, two case studies will be discussed in detail. The first case study will focus on the development of the Telidon in Canada, followed by some discussion as to its capabilities and some of its technical aspects. Also discussed will be field trials in which the

Telidon was tested under different circumstances, and to an audience having different informational needs. In terms of Masuda's phases of interactive development, the Telidon is viewed as a public service system. The second case study is the HI-OVIS (High Interactive -- Optical Visual Information System) system utilizing both audio and visual interactive video in Japan. In terms of Masuda's four stages of information utility development, the HI-OVIS represents both the public service and user production stages. In terms of community development process, the second case study shows greater input and accessibility of information, participation; both cast studies reflect to varying degrees citizens' input in the two-way information flow system.

A. Telidon (Canada)

In Canada, the specific name given to the information system developed by the Department of Communication Research Laboratory is Telidon. It is the advanced technological interactive videotex system.

Definition of Terms

Teletex	- a one-way information delivery system designed for mass market home and business use.
Videotex	- a two-way information delivery system in which users can call information to a TV screen from computer storage using a hand-held keypad or full alphanumeric keyboard. The information carrier can be a telephone line, two-way coaxial cable, optical fibre or microwave link.

Viewdata - an early name for videotex, and still used as a generic name for the British Prestel system.

Telidon - capable of operating in a one-way teletex or a two-way videotex mode with excellent graphic capabilities.

Background on Telidon

Aug. 15, 1978 - The first DOC announcement was made on the existing "A Canadian Videotex" system developed at the Communication Research Centre.

Oct. 15, 1978 - The Picture Description Instructions (PDI) which are at the heart of Telidon was made public in Paris.

Dec. 7, 1978 - A small group was formally organized to assist the researchers in transferring the laboratory to industry and helping to ensure that government objectives with respect to Telidon were met.

March 8, 1979 - The Consultive Committee on the Implications of Telecommunications for Canadian Sovereignty (The Clyne Report) was issued strongly supporting Telidon.

April 2, 1979 - A formal announcement was made by the Canadian Cable Television Association that the government had approved a nine million dollar, four-year program aimed at assisting Canadian Telidon field trials.

May 8, 1979 - The Gamma Group in Toronto in a meeting on "Videotex in Canada" recommended to the federal government that it establish a consultative committee.

May 31, 1979 - With Alberta Government Telephones, a trial program in Calgary with Vidon was set up.

July 20, 1979 - The Manitoba Telephone System announced Project Ida.

Aug., 1979 - Telidon was demonstrated in Sydney and Melbourne, Australia using direct access via satellite to the data base at the CRC outside Ottawa.

Aug. 28, 1979 - Bell Canada announced that its Vista Field Trials would use Telidon technology.

Oct. 2, 1979 - Torstar and Southam Press announced the formation of a jointly owned company called Infomart, principal objectives of which would be to act as an information service provider for Telidon field trails.

Nov. 26, 1979 - The Videotex Information Service Providers Association of Canada (VISPAC) came into being and elected Mr. Gerry Haslam as its first president. This group joined with the International Videotex Information Providers Association (IVIPA) whose membership was comprised of Videotex organizations from many Western countries.

January 1980 - TV Ontario began its broadcast of Telidon field trials.

July 9, 1980 - The Venezuelan government purchased a Telidon system from Infomart to disseminate government information to the public.

Nov. 6, 1980 - The project "Grassroots", a combined venture of the Manitoba Telephone System and Infomart, was announced; the Telidon system to provide up-to-the-minute information for farmers in rural communities.

December 1980 - Telidon Videotex System Inc. (TVSI) subsidiary of Informart (Canada) was formed with the mission to market and support Infomart's products and service in the United States. The company took a total system approach to marketing and installation and assumed full responsibility for all aspects of the planning, implementation, maintenance and support of its turnkey systems to meet customer requirements.

March 8, 1981 - The federal government announced 27.5 million dollars in development funds for Telidon.

The consequences of the two-way communications capability of videotex are enormous. Not only does it mean that the technical barriers to the amount of information which can be accessed are essentially removed, but also and perhaps more significantly, user feedback becomes possible, permitting use of the system for such purposes as remote banking, shopping, theatre, and travel reservations and opinion polling. Electronic mail is also possible with such systems.

The above mentioned services point towards the development of what might be called electronic home/office information and entertainment centres. Eventually the centre is likely to be a network system to include TV sets, home computers as well as video and hard copy printers. Forecasts are that these possibilities are no longer in the realm of fantasy but are now in the development of marketing strategy by major electronic firms. Obviously these new electronic systems will have high quality videotex terminals and printers and such luxuries as projection television and high quality TV monitors with superior resolution.

But electronics advances are not only the only advances significantly affecting our ability to have rapid access to information and to each other. Advances in space technology and in signal transmission using optical fibres are also profoundly affecting the way we live now and the way we will live in the future.

The Telidon is still an "infant" when compared to what researchers and forecasters predict are its possibilities.

Technical Aspects of Providing Information on Telidon

The mosaic approach to videotex terminal design is used both in Britain and France, giving the resulting images a square, mosaic tile appearance, hence the term alphamosaic. The Telidon system uses an alphageometric display based on computer graphics techniques and the geometric video screen includes points, rectangles, polygons, and lines (Thompson, 1979, 32). The display produces better quality, high resolution images on the screen both with text and detailed graphic illustrations. This resolution is about four times what is required for present day television receivers (Canadian, 1979). In the future, even higher resolution could be defined without affecting present day equipment. This system for code description of colour and high definition of images is referred to as the PDi coding system.

Telidon is ahead of the European videotex systems in that it is not tied to particular transmissions or display devices. It functions with ASCII code which means that much of the present information stored in computer systems could be used with it. It has six colours; white, yellow, green, magenta, red, and blue, six shades of gray, plus black and white (Telidon Reports, 1981, 30). What makes Telidon unique is the fact that the user can choose to move from page to page through the videotex data base (Lane, 1980, 18).

To date, all three systems, Prestel of Britain, Antiope of France, and Telidon have been officially ratified by the International Telegraph and Telephone Consultative Committee (CCITT) of the United Nations.

Field Trials (Six Cases)

1. Times-Mirror, Telidon in Orange County.

The Times-Mirror is the most diversified mass media company in the U.S. today. It has the U.S. dominant in four media: newspapers, magazines, books, cable and pay TV. Some 200 Telidon terminals are used over both cable and telephone communication lines.

Times-Mirror's objectives in undertaking a videotex pre-test in Southern California are:

- To define and implement a variety of videotex information services for mass-market consumer test.
- To design a consumer acceptance and to monitor the California pre-test.
- To create and analyze one of the major videotex trials in the U.S. and the world.
- To become the authority on mass-market applications of videotex.

The company believes that the videotex trials, to date, have been engineering demonstrations and it is convinced that without the proper content, videotex has no mass appeal. Results from the Knight-Ridder test in Florida and the King Research of Rockville, Maryland, which analyzed the information needs of citizens, concluded:

- citizens do not think in terms of first-order information needs.
- citizens do have situations which create second-order information needs.

In other words, citizens' information needs are related to everyday life situations and they turn to various information sources -- personal, institutional and media -- to find answers.

The pre-test focuses on some of the following questions.

- What are the information needs of consumers? How do these vary by age, income, race, education, sex, location, etc.?

- What are the everyday recurring situations that create information needs, etc.?

The priorities in descending order are:

a. Transactional Services -- Shopping; direct order, catalog, specials, subscription. Banking; bill paying, account transfers. Messaging; community bulletin board. Reservations; travel, sports, theatre, concerts, events.

b. Interactive Graphics Services: games, puzzles, etc.

c. Fast Decay Information: ads, sports, results, stock markets, movies, traffic reports.

d. Medium Decay Information: adult learning, library services, how-to, health programs.

e. Special Interest Groups.

f. Very Fast Decay Information: time, weather, traffic schedules, travel.

g. Slow Decay Information: dictionaries, reference, encyclopedia information.

The Times-Mirror planners believe that the consumer must be offered a great variety of information and subjects. Ultimately he is only interested in the information he is seeking, not in whatever may be available. Further, the trial has taught the planners the consumer characteristics [what Management Horizons calls "the myth of the average", (Dorrington et.al.) an average which no longer exists] and the integrative aspects of adding new information, organization, index, and cross reference. Further testing about interactive videotex continues.

2. Grassroots: Videotex as Application.

Manitoba Telephone Systems (MTS) and Infomart, are co-sponsors of Project Grassroots. Fifty Telidon units have been provided free for the user in this test: 26 are in locations where the agribusinesses gather. Before beginning Grassroots, Infomart had the benefit of several earlier studies. It had studied a videotex offering called "Green Thumb" which had been carried out in Kentucky, and one carried out for the Manitoba Telephone system called Attitude of Farm Families to Enhanced Rural (telephone) Services, 1980. This latter study concentrated on:

- Measuring attitudes of rural people about the current phone services (two thirds like it, almost half don't care about whether they have a private line, about half would like a "portable phone" as a C.B. or U.H.F. radio for farm use).
- Videotex (27% rated the imagined service as "very useful").

Those with videotex interest turned out to be the agribusiness operators. It was found that videotex as a concept has strong appeal for about a quarter of the farmers; the younger, more innovative and better educated on the bigger farms. By percentage, 27% of the farming population considered the Telidon an asset, 21% saw little use, and 8% no use at all. These last summed it up this way: "I don't need it. I got along fine without it until now. Waste of money." (Godfrey, 1981, 52)

3. Alternative Media Centre: Telidon.

AMC, the Alternate Media Centre at New York University is conducting a field trial of broadcast Telidon, using the WETA-TV signal. WETA-TV is the Public Broadcasting Station in Washington, D.C. Sixty Telidon terminals were placed around the city in public and private locations, including hotels. The sponsors are the Corporation of Public Broadcasting, the National Science Foundation, the U.S. Department of Education, and the National Telecommunications and Information Administration. The trial has six research objectives:

- To gather reliable data on the usage of information services. Where are the best public locations? Libraries, schools, health clinic waiting rooms, bus depots, or private homes?
- To assess the usefulness of the Telidon as a community information service. Does it help citizens get the public information they want and need?
- To determine the relative acceptability of different classes of information via this medium: entertainment, social services, hobbies, education, etc.
- To analyze the problems associated with managing a teletext information service and other issues dealing with implementation: day to day management of repairs, scheduling, and training workers (Godfrey, 1981, 59).

The AMC trial is concerned from the point of view of services rather than engineering. Phase II, if funded, will begin in September 1982.

4. BILD-Board of Industrial Leadership and Development.

The Honorable Larry Grossman, Ontario Minister of

Industry and Tourism, announced on August 28, 1981 a $11,000,000 Telidon Project called "Visitor's Guide". By the summer of 1982 there are to be 2,000 of these 50% government subsidized terminals out in the marketplace. By then it is expected that there will be about 50,000 pages of restaurants, accommodation, special attractions and events. BILD will thus comprise an electronic key/guide to the city of Toronto.

Planned placement of the 2,000 terminals will allow half of Toronto's visitors to have the opportunity to use Telidon. This could mean over 1 million people using BILD per month (Godfrey, 1981, 60). Following the summer of 1982, further expansion is planned, including individual terminals in hotel rooms, travel agents, shops, etc.

Grossman expects Toronto to become the Telidon/Videotex capital of North America. BILD is strongly supported by Bernard Ostry, an ex-Deputy Minister of the Federal Department of Communication, and now the Deputy Minister of Industry and Tourism under Grossman in Ontario. The project is an example of federal and Ontario cooperation. Under the 2 for 1 program the federal Department of Communication underwrites half of the "market" price of the 2,000 terminals.

5. Telidon as an Educational Medium.

Of all the services possible on the Telidon, the educational function is an important one. The Ontario Educational Communications Authority (O.E.C.A.) considers Telidon to be an educational medium in its own right (Bowers and Cioni, 1980, 13).

Telidon is a means of extending human communication and interaction. It is a device which can facilitate human objectives in a unique and efficient way. If Telidon gains the wider acceptance that its supporters are hoping for, it could be as ubiquitous as the telephone. It has, therefore, the potential of delivering educational experiences at a time and location convenient to the individual (Bowers and Cioni, 1980, 13). It is theoretically possible to store all book-recorded knowledge along with graphic information within data banks that can be accessed by individuals in their homes through the Telidon system. The educational uses of such a system (videotex-teletext) are virtually limitless (Zenor, 1981, 21).

Applications of Telidon for Education

a. Aid to TV Programming

Telidon text and graphics could be used to provide broadcast TV programming with added information such as schedules, lists of materials available, captioning for the hearing impaired, and notes and short reviews.

b. Alternative to Conventional Print Processing.

Telidon could be effective for providing educational materials such as course catalogues, bibliographies, textbook reviews, etc.

c, Educational Information.

Telidon is ideal for providing up-to-the-minute, real time data such as news, weather, stock, consumer, agriculture reports or reports on recently completed courses.

d. Messaging.

Messaging for educational purposes between administration, staff, teachers, students, parents, and any combination of these groups could be done on Telidon. For instance, a teacher could advise all her students that classes have been cancelled and give further instructions.

e. Graphic Aid to a Teleconferencing Network.

Images on Telidon terminals could be manipulated by individuals who are in voice contact over the telephone line. All parties could see what the others wish to communicate visually. In addition, the Telidon terminal could present visual images one after the other like a slide projector. Telidon's graphics capabilities enable it to provide a wide range of educational illustrations like music scores, charts, graphs, maps, and facsimile pictures.

Unlike passively watching a TV program or a film, the Telidon system requires active participation and an exercise of choice or decision for the learner. Since learning comes from involvement, from doing, from making conscious decisions, Telidon is an excellent educational medium in that it gives the learner an opportunity to do all of these things.

The information on Telidon can be changed easily; programs or pages can be corrected or updated immediately. This ability to edit or create new pages with ease is a major educational advantage of this unique medium.

6. Interactive Learning Programs.

Telidon can be truly interactive. In other words, not only can a student interact with the program in the computer data bank as in computer assisted Instruction (CAI), but with another individual, teacher or fellow student who is using another terminal. The future will see audio capabilities for Telidon and this will provide another channel of interactive learning.

Correspondence courses on Telidon could be individually paced and tailored to the learner. This would allow the opportunity for each learner to proceed at his/her own pace with periodic feedback on progress.

Educational Field Trials

All the field trials to date have had major input from educational institutions like the Ontario Educational Communications Authority, the University of Manitoba, the University of New Brunswick, and the Athabasca University.

Athabasca University

The Athabasca University has developed an independent Telidon capability on its own in-house computer and is proposing to offer its Telidon capability to other educational institutions within Alberta.

The proposed system will provide a number of capabilities not currently available on any other Telidon field trial system, including immediate remote updating of information and enhanced interactivity in the educational environment.

Some Concerns:

Hardware/Software: "Chicken and egg syndrome." The hardware people will not produce Telidon units if there is not a ready audience and software to put on the system, but the software developers or information providers (IP) will not produce materials in Telidon format unless there is hardware to make use of it. Telidon terminals are still too expensive for the average person. Along with the hardware, more software that is appropriate to the medium and useful to the terminal owner for purposes like educational activities must be developed and supported. Hardware and software are presently inadequate and a great deal of money and effort have to be put into their development.

The Tree Structure Data Base

All information on the Telidon is put into a "Tree Structure". Choice is made by pressing numbers on the keypad and working one's way to the desired information by the process of selecting more specific subject areas. As the user becomes more adept at using the keypad system, this approach becomes restrictive. Also all knowledge does not neatly fit into hierarchical categories and as the data banks become larger, the tree structure "does not necessarily provide an orderly structure" (Phillips, 1980, 9). Phillips argues that this hierarchical data base may have a short useful life. With the development of technology "the tree structures may become obsolete." (1980, 11)

Economics

The federal government initially spent $12.6 million on Canada's version of two-way television service. In 1981, a further $27.5 million was made available by Ottawa to make Telidon more commercially viable. In striving for wide market acceptance for the product, the Canadian government competed with two other countries, Britain and France, which are also spending money to promote their own videotex systems. In 1981 both countries spent $85 million each.

In Canada, the Telidon program will ensure production of at least 12,000 new Telidon terminals within a year. The aim is to reduce the unit price from $1,000 to between $300 and $500 by 1982 (Hoeschen, 1981).

Industry market forecasts estimate that from one to four million videotex terminals, worth over $1 billion to the Canadian electronic manufacturing industry, could be installed in Canada in the eighties. In June, 1980, the Manitoba Telephone System, with federal government help, began Project IDA, a trial of Telidon services in 100 homes in a Winnipeg suburb. Another experiment in Elie and St. Eustoche, 50 km west of Winnipeg, involved 150 homes. The production, design, and installation cost was $10.9 million.

Another of the Elie experiments, (Project Grassroots) is a commercial Telidon information service made available to 30,000 farmers in southwestern Manitoba. Infomart, a data base marketing and information provider, supplied data of interest to agricultural producers at a monthly cost of $60.00 for the Telidon terminals.

In an article in the Saskatoon Daily Star-Phoenix (1981, July 11), the author argues that a household will require an annual income of $70,000 by 1985 to afford Telidon. A study, which forecasts the domestic demand for Telidon services over the next 10 years, concludes that an unsubsidized service would be too expensive for the average home. The study says that by 1985, if Telidon were to cost $25 a month, only 26,000 households in Canada could afford it. Roger Hough, director of Roger Hough and Associates Ltd. of Ottawa, strongly argues that an acceptable market penetration would be achieved only if the monthly cost was $6.00. The report says that if Telidon reaches 650,000 households at $13.00 per month, it would require continued government support to reach full market maturity. (Godfrey et. al., 1981)

Given the cost of software of these new technologies, it is clear that the cost of the various services will play a key role in their public acceptance. For instance, although 80% of banking transactions are still paper-based, that figure could drop to 10 percent by the end of the decade. The consensus is that competitive pressures will be the driving force since automation is seen as the only way banks can cut personnel and capital costs (Globe & Mail, 1982, February 15).

The commercial and domestic markets for electronic gadgetry, including personal computers, appear to be becoming a well established pattern. The Financial Post (1979) reports:

> "There are 7.3 million households in Canada and their occupants obviously are gadget-oriented since they own 10 million T.V. sets, have 9.6 million telephones, and more than half the homes are wired for cable T.V."

Stuart Lipoff argues:

> "At the same time as more services are made available and hardware costs are beginning to fall, there is a demand being made in the economy." (1979, [illegible])

In a recently completed study, "The New Videotex Technology and Its Impact on Retailers in Canada", researchers Stephen B. Ash, School of Business Administration, University of Western Ontario, and John A. Quelch who is associated with the Graduate School of Business Administration, Harvard University, view "the videotex technologies to greatly impact many facets of both business and household environments" (1982, 13). Electronic mail may change the way businesses correspond, thus reducing paper costs and increasing communication speed. On a personal level, the availability of electronic funds could radically change banking practices. On a macroeconomic level, the successful implementation of this new technology could strengthen Canada's balance of payments through international sales. The potential impact of the videotex teleshopping would necessarily affect the retailer and consumer. Urban planners are still unsure of the impact on business of further construction of shopping malls and buildings in the cores of most cities in North America.

The research by Ash and Quelch anticipates, for example, that 15 to 20 percent of Canadian households will be equipped with videotex terminal equipment by 1990 (Stephen B. Ash et.al., 1982, 15).

General Conclusion of the Project

The greatest social significance of Telidon lies in the possibility that it offers far wider access to information and much greater ease with which this information can be transmitted. The combination of computers and communications through Telidon should lead to a further opening of the bureaucracies to the layman's inspection and criticism, by disseminating information more quickly and more effectively. Telidon should thus eliminate the need for many centralized decisions, and if properly managed, provide a greater opportunity for more flexible rules and regulations.

Telidon today is a neophyte in terms of computer-communications technology. The interactive facilities are new and for the first time they offer some level of interactive -- two-way flow of information to citizens. A great deal of experimentation, effort and research is required for Telidon to reach its full potential of strongly influencing our society generally and our education specifically. Telidon offers new and unique opportunities for communicating and learning; it offers citizens other alternatives and the means for accessing information relevant to everyone's specific needs. Telidon can present new, interesting learning experiences, provide equality or educational and learning opportunities, and improve Distance Education. The Science Council Committee on Communications and Computers (1978, 17) stated "The Science Council is of the firm opinion that implementation of an interactive computer-communication system (in Canada) is both desirable and inevitable."

The future benefits of Telidon could be significant. Its influence is spreading into many areas of business and education. It could provide facilities for individuals and citizens which they never had before. For example, the "computing power" of large computers has been the domain of big business and big government, but with Telidon, this computing power could become available to the individual within our society.

The consequences of the two-way communications capability of videotex are enormous. Not only does it mean that the technical barriers to the amount of information which can be accessed are essentially removed, but also and perhaps more significantly, user feedback becomes possible, permitting use of the system for such purposes as remote banking, shopping, theatre and travel reservations, and opinion polling (Godfrey, 1980, 93). Because of the information capability of the Telidon which operates through a switched network, the system provides instantaneous access to large data banks. Brown writes:

> "In contrast to teletext signals, viewdata signals are audio bandwith signals. They are usually transmitted over telephone lines but any audio bandwith channel can be used. Very conveniently these signals can be preserved on audio recording devices. Viewdata systems are usually somewhat interactive in that pages do not come unless requested. The data bases are large and are fundamentally unlimited in size. Access is for all practical purposes instantaneous. Data starts flowing almost immediately. While it takes a few seconds to fill a page, the lines appear as received at a rate faster than speed reading, thus the user is not waiting but reading almost immediately. The interface between the analog signal transmission channel and the digital logic is via a modem." (1979, 236)

Telidon's sphere of information services is wide in scope.

Due to its technological capacity to link with local, regional, national and international linking communication systems for sending and receiving information, the Telidon is an unprecedented tool for information accessibility to citizens. Ian White explains:

> "Telidon makes the use of the home TV screen and links it via cable or telephone lines to data banks stored in computers, or to other terminals or television sets. A simple button pad, similar to a telephone pad, enables the user to call up information in any data bank to which the system is connected.
> Other devices will allow the user to insert information into the system in either written or graphic form, and to communicate directly with other terminals or domestic television sets, without necessarily going through the central computer storage area." (1979, 27)

The ability to provide access to large data banks is only the beginning of videotex system services. Indeed the range of services is broadening the scope of possibilities as the potential to realize the electronic newspaper is taken together with electronic mail to provide a new mode of "electronic information" services.

As indicated, the Telidon can give many service functions. The level of social interaction, though limited, is nevertheless an important step in the development of some feedback into an information system (Nicheal, 1973). The interactive level between the individual and choices of information is new in the history of electronic media (Hawkins, 1980). Mass media has previously been essentially all one-way, but with the development of two-way telecommunications new channels will be made available for citizens to make the communications flow more broadly and more intensively within the geographic or nongeographic communities and with groups or individuals with decision-making authority. The trappings and constraints of our culture are being stripped away, and the communication of relevant and significant information to and from citizens reflects a new social process which allows more citizen participation in the exchange of information. With the opportunity to access, retrieve and input information, they are given more autonomy and connection and a sense of community in the world in which they live.

The input of the user has been minimal and for this reason Masuda considers the videotex to be the first phase (utility development stage) in the context of the information society. It is important that policies in communication in a Canadian context continue striving towards a situation where the rights to information reflect human rights. With an increase of information, negative entropy brings about social change. With the capacities of Telidon, further development in the hardware and software can assist citizens in becoming more integrated in their own communities. As each community reflects many individuals and groups with varying interest and concerns, information must be made available to those groups.

As for the foregoing six cases, the enhancement of choice through linking of data bases with network systems (Apple, educational system such as Plato, etc.) must be provided. Other key issues resulting from the six cases are:

- Low-priced terminals are needed to induce adoption.
- A payment scheme is required that doesn't penalize information-seeking or browsing activity.
- It is vitally important that the software function properly to maintain confidence in the system.

- Fast information retrieval (efficient indexing) and transaction completion are essential. If information retrieval is too slow, citizens will make other arrangements.
- Information must be current, especially price up-dating. With the Grassroots project, farmers required a continuous update on sales in order to maximize profit returns from them. Also, information on weather and forecast conditions was important so farmers could decide and plan their harvesting. Or as in the case of "BILD", information for tourist purposes must be current. Changes in schedules need to be made easily available so that alternative plans can be made.

The video future promises even more. So far we have looked at fragmentary aspects of the Telidon (videotex) at the early stages of its development. All the information one needs to run a business, manage a household, educate a family or entertain may well be available through the video system.

Today, the average household watches seven hours of television a day. What will happen when 3-D imagery and holography are added; when large screens make possible "video wallpaper" and you can buy a T.V. small enough to fit in your pocket? It is then that video will fulfill its promise of becoming the greatest tool ever devised for the imagination. Predicts Dr. Richard Green, director of advanced television technology for CBS,

> "If I want to make a study of medieval Spain, I will have manuscripts, plays and paintings at my fingertips. My T.V. set will be my library, where everything I care to explore will be available to me." (Rosenberger, 1982, 38)

Dr. Green adds that with the state of the art with 3-D high resolution imaging, one may experience "Telepresence". Larger, wider screens could wrap a scene around the viewers, while more natural colour and sharper details could engulf them more than movies do now. The current, 525-line picture offers a dull, blurred image when it is enlarged. But an innovation called high-definition T.V. (HDTV) promises to change all that to a sharp, bright image. In Japan, 35 to 50 inch T.V.'s have a picture resolution with 1,125 horizontal lines that is double the North American line system of 525. That could make every conventional set in the country obsolete overnight, a prospect that chills the Federal Communications Departments and delights T.V. manufacturers. With this further development of high-technology in the telecommunications field, holistic systems of information will be needed in order to maintain and create a world order with more unity. The technologies must be seen as a means of bringing people together across all barriers. The Telidon experiments in effect challenge man's view of himself in that when information is presented in a fragmentary fashion, citizens disapprove, making markets unacceptable. The need to expand the videotext makes community development workers aware of human potential yet unrealized.

B. HI-OVIS (Japan)

With the outbreak of the oil crisis, the Japanese industry was obliged to change its course from a manufacturing-oriented to a service-oriented industry. A service-oriented industry is said to be one where integration, in a wide sense, is rapidly reached between the service supplier (producer) and the service receiver (consumer).

The prediction is that, once society grows more service-oriented, production and consumption, which have been independent of each other, will become integrated, thereby causing a structural change in society.

When information service is seen from this point of view, television, which is the most typical information service of today but is nothing but one-way information which is imposed upon the subscriber, will have to be reviewed for its effectiveness as information service. The user in an information system expects to get the information he wants at his convenience and as fast as possible. Those who manage the system will expect the user also to offer information and to enhance the level of the system. This would be the state of the information system in a service-oriented society. In such an information system, the concept of supplier and receiver of information will lose its meaning. The user will be required not only to pay charges but also to function as an information source.

What means must be taken to develop the service-orient society? One of the solutions of the Japanese was to execute and apply technological and system development in the field of information for enhancing the level of a humane service-oriented society. Putting such a concept into actual use in the visual information field has given birth to the HI-OVIS (Highly-Interactive Optical Visual Information System). The HI-OVIS is equipped with two outstanding and unprecedented features. One is the full employment of optical communications technology in the transmission system of information. The other is the complete two-way feature for image and voice that is realized by use of the optical fiber. Namely, each home in the project is equipped with a keyboard, a camera, and microphone in addition to the television receiver, so that the family can hold conversations with the center and become a member of a program while staying home. Further, by operating the keyboard, the family can select any information, at any time and in any form from the data base at the center.

This project has been developed as a local information system to offer information on daily living and local affairs. It is also expected that the two-way feature will contribute to people participating in programs and discussions, thereby reconstructing communities. This two-way information system can provide information to enhance daily life conveniences and promote lifelong education. Sources of information were obtained from an evaluation report "HI-OVIS Project -- Hardware/Software Experiments, July 1978-March 1980." Some graphics and a general description of the project were used in order to illustrate the thrust of this project in view of the kinds of mass media developments currently tested with a view for social and qualitative considerations.

The HI-OVIS (High Interactive-Optical Visual Information System) was completed in seven years from its inception at Higashi-IKOMA New Town in Nara Prefecture at a cost of $16 million. This system is the first major experiment of its kind, a future living visual information city. It utilizes optical fiber cable for two-way multiplex communication of video-audio signals and data; it links 158 households and 10 public institutions (school, a fire station, and the city office). This system has the following three distinquishing features:

a. With optical fiber communication network, users on this HI-OVIS system can receive programs from 30 TV channels, and calls from 1,000 telephone lines at the same time.

b. It permits two-way multiple communication by visual, audio and digital methods. For this purpose, the system uses a composite set that combines TV, a keyboard, a video camera and a microphone installed at the user's end.

c. The HI-OVIS city is essentially a Wired City.

The following four services are provided in the experiment:

i. TV retransmission service
ii. Video request service
iii. Still picture service
iv. TV studio broadcasting

The contents of these services are being constantly up-dated. It is the last service, the TV studio broadcasting, that has been found to be the most important of all the services it offers. For example, the user can participate from home in a TV program by appearing on the screen and speaking to other TV viewers and providing home data. In other words, the user's own voice and image can be heard and seen on the TV screen as desired and opinions can be recorded by digital signals in a public opinion poll. In this way, the user can participate in a local discussion meeting, take part in foreign language lessons, ask and reply to questions, participate in quiz programs, charity auctions, debates, etc.

For instance, in an educational program entitled "Let us Discuss Education", on the NHK (Japan Broadcasting Association). TV network, HI-OVIS was connected with the NHK network. Two studios, one at NHK headquarters and the other at the HI-OVIS center, were integrated, more than 500 kilometers apart. On the screen, the panelists not only in the NHK studio but also at the centre spoke in turn. The participants in the program at the center replied to the moderator's questions by pressing their own push-buttons. Ninety percent of the HI-OVIS subscribers participated.

Background

This system incorporates computers, optical-fibre cables, microphones, camera and other terminal devices. It offers request functions as well as two-way communication functions. Services provided are video information, still-picture information and local origin programs. The system provides a means for enhancing daily life conveniences, promoting lifelong education and improving public communications. Basic design and preparation for experimental transmission were completed between the period of 1973 through 1977 and have been used continuously on a test status since 1978. Higashi-IKOMA, Japan, is the subject of an experimental zone; monitor-homes number 156. The experiments are being conducted by VISDA (Visual Information System Development Association) under support of the ministry of International Trade and Industry, Japan. Satisfactory experimental results both in software and hardware aspects are highly promising.

Philosophical Basis for HI-OVIS Project

In the Japanese marketplace, there are drastic changes occurring. The most dramatic is the shift from a manufacturing to a service-oriented industry. Integration between supplier (producer) and consumer (demand) is the true nature of the service-oriented society. They are becoming interdependent in their roles and thereby causing the structural change in society. As TV has been the one-way delivery of information to the subscriber, the dynamics of economic and social forces makes new requirements on the consumer. Now the consumer must provide information into the system at all levels of society as well as retrieve any information pertinent to his needs. Consumer and producer therefore play mutual roles of being providers and receivers of information. The significance of the experiment is for the user to offer information and to enhance and upgrade the level of the system. "You must put in, in order to pull out." This is the status of the information system in a service-oriented society.

One of the solutions to a service-oriented system is to execute and apply technological and system development in the field of information. Putting such a concept into actual use has given birth to the HI-OVIS.

Two Unprecendented Features

One of the unprecedented features is the full employment of optical communications technology in the transmission system of information. The optical fiber is used in all transmission lines and is led into homes. The other is the complete two-way feature for image and voice that is realized by use of the optical fiber. Each home is equipped with a keyboard, camera, and microphone in addition to the television receiver, so that the family can hold conversations with the center and become members of the program while staying home. Further, by operating the keyboard, the family can select any information, any time, and in any form (video, still pictures through microfiche and character information stored in computer) from the data base at the center.

Perhaps most relevant and more directly related to community development is the fact that the system will provide information on daily living and local affairs in a manner unprecedented by using the broad-band transmission line. It is also expected that the two-way feature will contribute to people participating in programs and discussions thereby reconstructing communities undergoing dissolution or establishing communities in newly constructed towns.

Indication of Experiments

The hardware of the HI-OVIS, developed with 158 homes as subscribers, has been subjected to operational experiments. Results of these experiments were described in a summary report July 18, 1979. The following facts have become evident:

a. Optical-fibre transmission technology proved to be of remarkably high reliability.

b. Public's participation in programs of highly needed local information has great significance.

c. The new medium was successful in enhancing local community consciousness. For example, entertainment and parties were initiated by the public; some of the people at home who received the service stated that their circle of acquaintance became larger.

Objectives of HI-OVIS Development

The HI-OVIS consists of a combination of the computer, two-way broad-band transmission line, and home visual terminals (television, keyboard, camera, microphone, etc.). The following assessments are the targets of development:

a. Prospects of visual technology in view of future technical development and marketing.

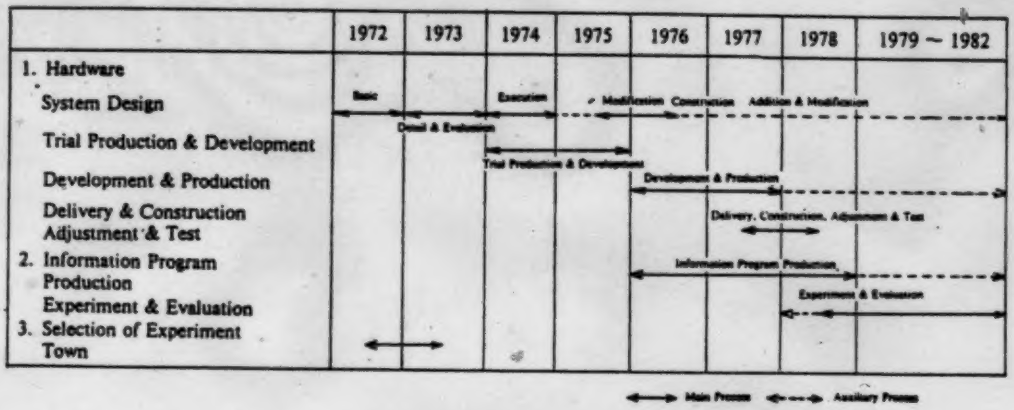
b. Effectiveness of the two-way visual information for application in society.

c. Program and service compatibility with subscriber requirements -- to form a new community in local society.

d. Tentative system becoming the model for a two-way visual information system for application in the future.

Plan of System Development

Table I-1 Development Schedule for Hi-OVIS



Since the summer of 1978 experimental evaluations have been performed. In 1979, terminals were newly installed in the university.

Selection of Pilot Town (Higashi-IKOMA)

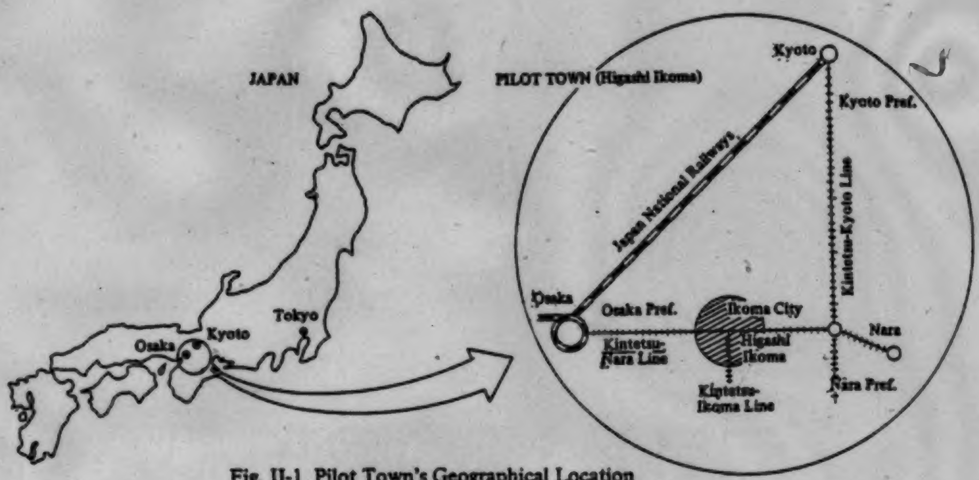

JAPAN
Tokyo
Kyoto
Osaka
PILOT TOWN (Higashi Ikoma)
Kyoto
Kyoto Pref.
Japan National Railways
Kintetsu-Kyoto Line
Osaka
Osaka Pref.
Ikoma City
Nara
Kintetsu-Nara Line
Higashi Ikoma
Kintetsu-Ikoma Line
Nara Pref.

Fig. II-1 Pilot Town's Geographical Location

Program and Information Service

To embody the ideas of this system's development in programs and information service, planning and development were effected with the following points in mind:

a. Establishment of a new community.

The objectives are 1) to create a warm-hearted human relationship contributing to the establishment of a new community through the development and application of programs and information service, 2) to establish an atmosphere in which administrative and educational institutions of the region can cooperate in performing the system application experiments.

b. Contribution to lifelong education.

The objectives are to meet the needs of lifelong education, to prepare educational programs and information services needed by subscribers and stimulate them to study these programs and information services.

c. Contribution to the community's welfare and safety.

The intent is to actively consider welfare and safety problems of social interest through the development and application of programs and information service to stimulate subscribers to action aimed at a safe and sound social life.

d. Selecting information at subscriber's own will.

People are accustomed to receiving information only passively. It is necessary for them to realize the subscriber must be able to use any information he needs at any time to improve his intellectual and emotional life.

The designing of programs and information service reflected the above mentioned concepts. Programs must be those which local residents are free to accept and join in. One important feature is that people will participate of their own free will and build communities by their own efforts and labour. Voluntary communities in the information society have more free time and a high standard of living and level of education. The way of life of these people will expand from material consumption to the fulfillment of their desires. It is at this stage that synergetic system and participatory democracy become a reality. In viewing some of the principles in community growth, the program's design became important in that:

(a) information dealt with must be closely related to local residents.

(b) programs and information must be easily produced.

The programs must be made to stimulate residents to take part in the system. If the viewer cannot accept a certain system, there is a good possibility the meaning of carrying out an experiment will be lost.

Operation of Programs and Information Service

The development of programs and information services was carried out in three phases.

Phase I was to foster a foundation for the operational experiment. This phase was for the establishment of a habit of looking at and listening to the HI-OVIS. In this phase, it was observed that there had been drastic changes in the life style and consciousness of each subscriber. This change is roughly summarized as follows:

(a) change in the length of hours to watch T.V.,

(b) change in the selection of programs to watch,

(c) formation of new local communities or change in the attitude of residents towards the community, and

(d) change within family.

The second component of Phase I was the formation of a foundation for participating in the two-way service. A major reason why some participants did not take part in the two-way service was that they had no previous experience in appearing on the T.V. program and psychologically, it was very natural to feel embarrassed having their pictures displayed to others. The non-participants at a later date were motivated by those already participating, thus they took a voluntary action to promote participation. Both groups were brought together in order to become accustomed to speaking with and to others by two-way television. The two-way triggered actual contacts among subscribers; those who knew each other through the picture exchanged words on the street.

The third component of this phase was making the information available according to the needs of residents. The advantage of the request service is that one can choose a program at a convenient time.

Phase II was similar to Phase I. It diversified the utilization of media functions of visual information service and used two-way service more effectively and thus changed the needs for two-way services. As well, more people participated in the program's development on the two-way service system. In Phase I, it was found that the biggest barrier for non-participants was shyness. In Phase II, those not using the system claimed their reason was being too busy to watch when the two-way service was available. From this data, it can be said that the critical point in encouraging participation in two-way service is drawing out the potential interests of the local residents.

Also in Phase II, teleshopping categories were added to the system. Here the system offers commodity information in cooperation with major department stores in Osaka. T.V. shopping service was favorably rated as an information program for daily life.

In Phase II, the experiment was directly related to activities of local self-governing groups. All the responsibilities were placed with the subscribers, while the studio functioned only for switching up images. As a matter of fact, subscribers' interest in this program was much higher than other programs. Themes taken up were overwhelmingly those related to the activities of self-governing groups such as regional environment, city planning, traffic, and local administration. Of those residents participating in the program, there was a consensus that their local problems should be discussed through the program.

A two-way study from the viewpoint of technical education was undertaken. The subjects chosen for experiments took into account a variety of needs of the viewers: music (guitar), calligraphy, English, and do it yourself. In Phase III, advanced technical education was added, such as bookkeeping and typing courses which enable viewers to acquire special skills. Medical information was also added as the pre-experiment questionnaire showed a strong demand for health and medical information.

Phase III continued from Phase II. The stress, however, was on the visual information system, and the establishment of new local communities. A community was traditionally formed spontaneously and necessarily so that the people living in a certain area could protect their commoness. But in contemporary society the factors which had supported the existence of old communities have almost disappeared. What we have to do through a new information system is pursue, create and form a new image of the community that will fit this contemporary society.

Generally speaking, the HI-OVIS not only displayed a function of the information system as hardware, but also played the role of community center, consumer center, and health and medical center for the area. The base line of development of the HI-OVIS is a formation of new local communities, and the following data of a survey make it clear that the HI-OVIS has contributed to formation of new communities through its full-scale operational experiments. Table V-I shows what people think was most remarkable (See below).

Table V-1

	Total 335 persons	Men 142 persons	Women 151 persons	Children 42 persons
1. I could deepen my understanding of the place where I live.	43.0%	42.3%	46.4%	33.3%
2. I've become interested in local problems, and think about them more often.	25.1	27.5	27.8	7.1
3. My circle of friends was enlarged.	23.9	26.8	23.8	14.3
4. I've changed to watch the Hi-OVIS from conventional TV.	23.5	25.4	26.5	7.1
5. Hours to watch TV increased.	22.1	20.4	23.8	21.4
6. I've got new hobbies and something to study.	13.7	7.7	19.9	11.9

The first three replies of the above table clearly indicate that the impact of the HI-OVIS on life was great enough for it to function as a community medium. Others pointed out changes in lifestyle and in habits of TV watching.

Table V-2 was the result of a questionnaire, "Has there been any change in your consciousness toward TV since HI-OVIS was introduced to your home?"

Table V-2

	Total 335 persons	Men 142 persons	Women 151 persons	Children 42 persons
Yes	66.0%	64.8%	66.2%	69.0%
No	23.9	27.5	21.2	21.4
Do not know	10.1	7.7	12.6	9.5

Table V-3 indicates how people have changed because of HI-OVIS.

Table V-3

	Total 221 persons	Men 92 persons	Women 100 persons	Children 29 persons
1. I have found difficulty in producing TV programs.	65.2%	55.4%	71.0%	75.9%
2. I came to feel TV close to me.	50.7	43.5	54.0	62.1
3. I came to think about other possible utilization of TV.	44.3	58.7	38.0	20.7
4. I've found a merit of conventional TV.	5.9	3.3	7.0	10.3
5. I've found conventional TV uninteresting.	3.2	3.3	4.0	0.0
6. I've found it rather easy to produce programs.	1.4	2.2	1.0	0.0

Table V-4 indicates how people's attitudes changed toward the community. The question was: "What change has been brought by the HI-OVIS in your social life, in the neighbourhood, or in the community?"

Table V-4

	Total	Men	Women	Children
1. I have met new friends and acquaintances through the HI-OVIS.	32.1%	29.4%	34.1%	34.5%
2. I found various kinds of topics for conversation with neighbors.	28.3	26.0	35.1	12.7
3. I began to exchange greetings and words with neighbors.	22.8	21.5	27.6	10.9
4. Family-to-family contacts with neighbors increased — such as going out for dinner together.	4.6	4.5	4.9	3.6
5. I began to accept delivered articles for neighbors temporarily out.	4.6	4.0	6.5	0.0
6. I began to go shopping with neighbors.	3.1	1.1	4.3	5.5
7. Exchange of food increased.	3.1	0.6	4.9	5.5

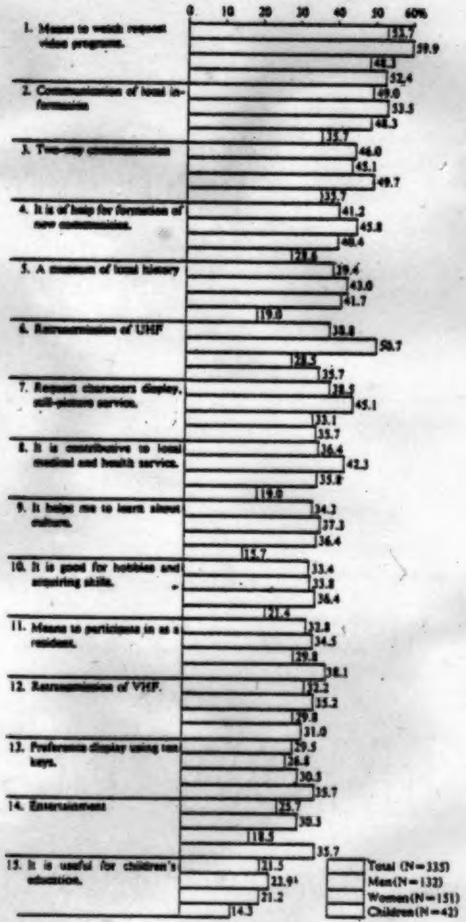
Table V-5 is a summary reply to, "Do you think your neighbours have come to feel familiar and cooperative with each other?"

Table V-5

	Total 417 persons	Men 177 persons	Women 185 persons	Children 55 persons
Yes	36.0%	36.2%	35.7%	36.4%
No	13.2	10.7	16.2	10.9
Do not know	35.5	35.0	34.1	
No reply	15.3	18.1	14.1	10.9
	100.0	100.0	100.0	100.0

It can be said that HI-OVIS plays a significant role in the community as a local medium.

Table V-1 gives a summary of people's expectations of the HI-OVIS function service.



✓Figure V-1 "What is the Hi-OVIS to you?"

General Conclusion of the Project

1) Local Community

A considerable degree of community consciousness has been established in Higashi-IKOMA in the experiment period of one year and nine months. The following data was used to measure the degree of community formation.

- Local origin program
- Subscribers' participation on local origin programs
- Subscribers' opinions

With technological help of the staff in handling transmitting equipment, audience participation has been extended to a major part of the program production, taking in its hand the planning, appearing and chairing. The HI-OVIS is becoming the local community centre and its two-way system is playing an active role in bringing about and expressing community consciousness.

2. Contribution to Lifelong Education

The term life-long education has come to mean assisting people in learning what they need to enjoy culture, art, and sports throughout their lives, finding something worth pursuing in their occupations, or improving and enhancing their knowledge and skills required for domestic and occupational reasons.

The programs were trying to meet these requirements:

a. Request video programs for culture, sports, hobbies, local history, cooking, flower arrangement, medical and health care.

b. Provide regular programs for skill-training, English conversation, bookkeeping, typewriting and guitar classes.

c. Provide hobby programs in the local origin programs to cover leather craft, reading, writing, painting.

The high audience rate lies in programs of entertainment, local information, and medical and health care.

Active Selection of Information

The subscribers of HI-OVIS can all select the information they need from some 150 kinds of information through a total of 29 channels; 9 commercial channels, 1 local origin program channel, 7 channels for requesting video pictures, 7 channels for still picture service, and 5 other channels for reservation.

Contribution of Welfare of the Local Society

The role of HI-OVIS is to attain a secure, safe, and healthful lifestyle for the people. HI-OVIS has functioned as a social system in an organic union of educational, cultural, medical, and industrial features of a locality working for a better life for its residents. It is possible for HI-OVIS to meet the requirements of the aged society, providing for them a greater opportunity to receive information about education and various services like medical and health care.

Conclusion

These experiments are contining. In terms of Masuda's four stages of information utility development, the HI-OVIS presents both the public service and user-production stages. Public information was made available and used extensively on the HI-OVIS.

With respect to the user-production stages, the HI-OVIS is an ungraded telecommunication system similar to Telidon. With it, the citizens actually produced information for some of their programs; the project required their participation. The two-way system is more interactive in nature as it has the capabilities of an audio-visual system to link people in the towns of Higashi IKOMA. The following data was used to measure the degree of community formation reflected from:

(a) HI-OVIS community T.V. -- local origin program's viewpoint.
(b) state of subscriber participation in local origin programs.
(c) subscribers' opinions.

The citizens' participation, particularly of its two-way system, is the central concern in viewing the formation and development of community by HI-OVIS. The two-way system played an active role in bringing about and expressing community consciousness. It also assisted people in learning what they need in order to enjoy culture, the arts, sports, or improve and enhance their knowledge and skills required for either domestic life or occupations. The programs have uncovered the potential needs of citizens and have been in effect an avenue for the advancement of life-long education. The experiments need to be continued and re-examined for the achievement of greater educational effects. In the process of learning, the citizens of HI-OVIS had a total of 29 channels, 9 commercial channels, 1 local origin program channel, 7 channels for requesting video pictures, 7 channels for still pictures and 5 other channels for reservation. The technical capability has allowed for more independence and active interest of individuals and special interest groups in that essential information was made available when requested. Perhaps the question to be answered in larger projects is how to input information in order to meet an extreme variety of people's needs.

Whatever the combination, citizen participation is an essential condition, the most desirable form of which would be mixed and citizen-oriented. The main reason is that only by citizen participation in the management of information utilities will (1) the self-multiplicative production effect of information be expanded, (2) autononomous group decision-making by ordinary citizens be promoted, and (3) the dangerous tendency toward a centralized administrative society be prevented.

The HI-OVIS case study in effect characterizes the concept of information space. In such voluntary communities, ties to a locality will not necessarily be a fundamental property of the community as they have been in the past, because the emphasis and binding force will be shared common ideas and goals. Such a community, not being tied to one locality, is one that has information space which is invisible but bound together by information networks based on computer communications technology. People belonging to such a community will work together in a way to achieve a shared goal; they will need to be able to change their roles in response to current demand and the assignment of new tasks within a community as a whole. So generally speaking, citizens who are members of voluntary communities will belong to other social groups as well, thus being "multi-belonging" citizens. The fundamental characteristic of such multi-layered and voluntary communities will be their freedom from ties to a local place. The fundamental goal and philosophy is to bring and bind people together; it is the technological base of computer communications network that will make this possible. Communities formed in this way can be described as functional information spaces connected by information networks.

What we have seen with the Telidon and the HI-OVIS experiments are the beginnings of how citizens' participation through voluntary association form functional communities connected by information networks.

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CHAPTER IV

COMMUNICATION AND DEVELOPMENT THEORY

The steady advancement of communication technologies and their rapid expansion throughout the world has created high hopes for the role of communications. The purpose of this chapter is to review contemporary views and theories on the role of communications in development.

It will be argued that communications play a critical role in the process of development, potentially hazardous or beneficial depending on the kind of communication policies pursued (Curron et al., 1977; Gerbner et al., 1973; Tehranian et al., 1977). These range from the extreme of directive policies, favored by totalitarian regimes, to permissive policies such as commercial systems. Both extremes rely on manipulative techniques to change audience's attitudes and behavior. Change is brought about by having one-way information, repeated over a period of time to a given audience. Changes here are because of something out there. There is a cause and effect relationship. It is somewhat based on the theory of learning based on social conditioning (Thorndike and Gates, 1930).

Until recently, both broadcasting and telecasting systems in Western countries encouraged more media (radio and TV) networks to include more community programming on local stations or public broadcasting systems (as PBS or BBC) which the commercial systems have little interest in. However, in these countries, mixed policies are often pursued by different systems to meet varying audience requirements.

An alternate approach may be a pluralistic information utility, a "network of networks" which decentralizes by stressing participatory feedback in mass information utilities. Licklider's paper (1970, 60) appeals for the current approach on television technology to be redirected so to serve human creativity and social cooperation, with appropriate safeguards for individual privacy.

An appropriate policy may be called reflective, in that it aims at holding the mirror up, trying to educate the audience through interactive and responsive communication, authenticating the audience's social and historical experience. "For it is in communication," as Lee Thayer has put it aptly, "that we create each other as humans, and it is as humans that we create everything else that constitutes human civilization. In the process of human unfolding, as well as of social evolution, communication and identity are both the beginning and the end." (Thayer, 1976). Through the mutual exchange of ideas, feelings, experiences and skills between people, information is shared in the activity of communicating. From this perspective, new insights into how people communicate with each other have been constructed.

Role of Communications in the Process of Development

The field of communications policy is relatively new and generally lacks an accepted definition. Most definitions include three fundamental elements: communication as a 1) need (human right), 2) creative activity, 3) resource.

Communication is a concept elastic enough to imply interpersonal, institutional and mass communications. The Handbook of Communication defines communication broadly as "one of those relatively few fundamental and encompassing processes through which virtually any social event can be portrayed" (Pool et al., 1973). In the introduction to Source Book for Communication Planners, Alan Hancock (IN Press) suggests a definition of the field of communication policy;

> "While the concept is not used purely to imply mass media, it is used to denote the sum of those media channels and institutions which have a technological base. This is because the emphasis upon communication of a natural resource implies a commodity which is subject to production, marketing and distribution in some way; and for such an understanding it is the market potential of communication which is being primarily high-lighted. However, the understanding goes beyond that of mass media; it includes other technologically based items, such as computers, information systems, point to point telecommunications and telephoning. Moreover, it goes beyond the basic premises of technology to include those aspects of human communication (information flow, diffusion) which arise out of or surround the technological base and which may also be the subject of planning." (Voight, 1979, 121)

This definition focuses on those areas of communication which are technologically arranged. Most such forms of communication are purposeful and consequently are predicated upon some communications policy. Communications policy may be interpreted, therefore as a set of "norms, standards, and principles, which govern communication behaviour, particularly at an institutional level . . ." (Hancock, 1977). Since planning is contingent on clear objectives, and since objectives cannot be articulated with any precision without overall goals and policies, it follows that communications policy formulation is a precondition for communications planning. In this sense, communications policy cannot be divorced from cultural policy, information policy, transportation policy, and science, technology, and education policies. Some of these policies (cultural, information) are at the heart of a communications policy; others (such as transportation, education, science, and technology policies) provide critical linkages and overlaps. These linkages appear as a set of legal, political (control and accountability), economic (ownership/incentives), and organizational regulations governing the communications enterprise of a given political entity.

Thus an integrated approach to communication policy calls for 1) an assessment of the international environment and the options available for the choices of development strategies; (2) an analysis of the national communications system, including a study of the mass media as well as the point to point telecommunications system in order to choose among the variety of public and private, centralized and decentralized systems of control and ownership; (3) an evaluation of communications needs and of public expectations at the local, regional, and national levels (appropriate mix of technologies, institutional arrangement and software); and (4) the design of appropriate feedback mechanisms in order to provide an ongoing evaluation of the communication system.

The underlying assumption of this process of policy formulation and planning is that communications should serve people's needs and the country's national development goals. Planning should be an interactive communication process, in which perceived needs and expectations are communicated from bottom to top. These national, regional goals and objectives are shaped and formulated on the basis of these messages and transmitted from top to bottom. The challenge of planning is to reconcile in a constantly changing environment the demands being pressed on a country's scarce resources, public attitudes and expectations, and the level of understanding and frequency of communication occurring between the top to bottom. Vaill (1967) suggests that there is considerable empirical evidence that human systems undergo many equilibrium-disturbing experiences and that as a result they change rather than return to old patterns. This is a concept different than the one from Malinowski, which relates behaviour to a presumably stable system of needs and mechanisms and where the basic need is seen as the maintenance of the equilibrium of the system (Selznick, 1969, 267-8). The concept of the open system emphasizes the importance of the total environment from which come the imputs which influence change in the system. This would mean that policy and planning of communication is subject to change allowing discipline and creativity in the overall planning process.

Modern means of communication places enormous powers in the hands of governments; powers which can be used for good or evil. A present trend is for governments to have political control and development over multi-nationals who wish to centralize financing, program production, and hardware distribution with a view to monopolizing communications systems. In Canada, the report Telecommunications and Canada (1979) makes a strong recommendation that the operations of content and carriage undertakings should be separated. The principle of content and carriage separation already governs the operations of the federally regulated telephone companies and CNCP. They are, by law, in most cases required to carry the messages of any potential customer without unjust discrimination at fair and equitable rates for similar services and without interferring with the content of the messages carried. In essence the report strongly suggests that the communications industry in Canada be altered as to give official responsibility to different bodies. Each body would have control, accountability and organizational responsibilities to given functions within a total communications environment while at the same time be capable of responding to specific market requirements, consumer pressure and corporate departments.

Despite these considerations, it is wise to recognize that communications policies are basically derivatives of the political and economic environments and institutions under which they operate. Any alterations within these environments will be reflected by sudden changes in the market place. This pressure requires policy changes in the broadcasting industry which then require policy changes at the provincial and federal level.

The idea of "development" has been in fact one such legitimizing force, operating increasingly on an international scale. These challenges have become more insistent in the last few decades, principally because of the rise to historical consciousness under conditions of exploitation, poverty, the idea of evolutionary process and the modern conception of nature and current awareness of man's needs for the unfolding of human potentials.

Historical Context

Every society, global or local, is in part what it is because of the history of its own development. As the twentieth century draws to a close, the global society built up by four centuries of colonialism, two centuries of industrialism and a few decades of advanced communication and space technology is an extraordinary mixture of the traditional and the unprecedented (Ward 1979). Centuries of mutual trade and the economic threats of economic connections and interdependence in price, supply, services, financing, and management, have woven the continuous fabric of a single planetary economic system. The Club of Rome (Limits to Growth, 1972; Reshaping the International Order, 1977) and the United Nations conferences on the environment, trade, food, energy, and the North-South dialogue are all symptoms of a new era of international communication on development. The call for a new international economic and information order have focused on the inequities of present North-South economics and cultural relations (Tinbergen, 1973; UNESCO, 1975). The present structures are imposing serious constraints on the developing countries. Even though the world is divided into increasingly countless communities of interest, overlapping each other, the nature and style of these communities are intellectual or spiritual rather than simply geographical. Communications systems are viewed not as "social overheads" to be ignored or tolerated, but as basic needs and rights of human society (UNESCO #76, 1976). Rather than looking at information as a disposable luxury product and the audience as a "consumer" and therefore just a "receiver," it becomes more and more important to approach both policy formulation and planning for communication in a positive manner wherein the potential of communication is seen within the socio-economic structure of a society.

It has been increasingly recognized that a human resource strategy of development is indispensable (Lowe, 1970, 82). Such a strategy would concentrate on transfers of knowledge rather than of goods, through literacy, training and education, employment, research and development, and social mobilization. For their success, all these activities rest on the effective use of communications (Birou et al., 1977; Erb and Kallab, 1975).

In resource-rich countries endowed with substantial foreign exchange, development has frequently come to mean, exclusively, an economic strategy with symbols, power, prestige and affluence. Every conceivable gadget is bought and sold on the premise that goods are to be consumed and be the key to human growth, development and socialization. Contrary to this view, writers such as David Spangler, Nikolais Berdyaev, Aldous Huxley, Theodore Roszak, Erich Fromm, Edward Hall, Rollo May, emphasize that development strategies must include and respond to all our needs. Since those needs range from the biological and socio-economic to spiritual, innovative learning is necessary for the introduction of new technologies, possibilities, consciousness, and the creation of new meanings.

The capital intensive strategy of development is based on growth, control, distribution, work-rate, and scarcity. All stem from the industrial system. Broadcasting policy and network in large measure have reflected a policy which has encouraged a centralist production and distribution programming design for the consumer.

The changing local, regional, national, and international situations are reflected in the changing theoretical perspectives on communications development. The early pessimism of the fifties

(Boecke, 1953; Nurkse, 1953), and the subsequent optimism of the sixties (Lerner and Schramm, 1967; Rostow, 1960) have given way to a new sense of realism on the diversity and complexity of the development process (Rogers, 1976; Schramm and Lerner, 1976; Tehranian et al., 1977).

Theoretical Context

Broadly speaking, three schools of thought on the role of communications have been subjects of considerable speculation in development theory. First, there are those (classical and neoclassical economists (Hansen, 1941; Boeke, 1953)) who consider communications as an infrastructure in the process of development which is viewed as a precondition for economic growth. Information technology, seen as a substructure to reinforce old patterns and hence truly diffuse benefit--information systems, really does not offer ordinary citizens an obvious opportunity partly due to cost, complexity of operation and difficulty of access. Secondly, there are those theorists who view communications as an integral factor in the process of social change and modernization (Slater, 1977; Baron, 1957; Berger, 1973). Thirdly, there are those researchers (primarily social psychologists focusing on microsystems and media effects) who consider communications as a residual factor in the process of social change, to be studied on its own and without much prejudice as to its role in the development process (Malinowski, 1927; Rogers, 1962; Innis, 1950). As the role of communication is a subject of considerable speculation in development theory, a schematic view of the five main theoretical tendencies will be considered as a tool for understanding the varieties and complexities of the role of social communications in economic development. These are:

1. Neoclassical views of economic growth and underdevelopment,
2. Neo-Marxist and Third World views of development and underdevelopment,
3. Liberal views of social and political development,
4. Synthetic approaches to communications and development,
5. Behavioural views of media efforts.

Theoretical trends within each of these five categories will be discussed and emphasis will be put on those areas which tend to consider the role of communications in development as more or less critical.

Of the five main theoretical positions on communications and development, the first is held primarily among economists. Both classical and neoclassical models of economic growth consider free flow of information and communications among buyers and sellers. In the classical model, price is viewed as the core of economic activity determined by supply and demand of goods. The means of transportation and communication are therefore considered as infrastructures which contribute to production. Supplies, energy, and information must be supplied through the media of roads, railroads, postal services, telecommunications, advertising, etc. Thus the classical economist views information as a unit of software, which can be quantified and sold, although historically, he has confused "content with packaging" and has yet not been able to sell information per se.

Starting more or less with the same assumptions, the neo-classical economist views rate of investment as the critical factor. By contrast, the neo-classical traditions pay greater attention to the elements of information, knowledge and innovation, without losing sight of the importance of the investment as the engine of growth. The classical view stresses the communication links between systems while the neo-classical view acknowledges the importance of information to economic growth. Human capital investment theories have laid stress on education and research as the mainspring of the developmental process (Harbison, 1973; Harbison and Myers, 1964; Schultz, 1974).

The second school of thought, considering the role of communication as a critical or integral part of development, contains a number of different theoretical positions. The Marxian model of development generally considers communications to be an integral though not a decisive part of the development process. Ideological considerations serve the function of legitimizing the interest of social classes in the process of historical evolution. Communications, however, is viewed by Marxists as a particular ideological formation which follows more or less the pattern of material production in society. Ideologies play a predominate role in the process of social change whereas communication plays a functional part in this process. The ideologies of the ruling classes constitute an essential part of the class struggle of the oppressed masses. In the process of liberation, the masses cast away "false ideologies." The liberationist theorists concern themselves primarily with the political economy of domination and are firm believers in the unity of theory and practise. Lenin, Mao, and Che Guevara may be considered among the activist- theoreticians.

There are those who, on the other hand, put more stress on the legitimation theory. They focus on problems of ideology, mass culture and mass communications. Karl Mannheim (1929) father of the sociology of knowledge, as well as the Frankfurt School (Adorno, Harkheimer, Fromm, Marcuse, etc.) and Berger (1973) may be considered here. Also there are Herbert Schiller (1973), Paul Freire (1970a, b), Ivon Illich (1971a, b), and E.F. Schumacher (1973) who have focused more narrowly on some selected social, cultural, educational, technological, and mass media aspects of development in communication. The common theme in all of these writings is the characterization of the present model of international capitalist development as economic exploitation and cultural domination. The process of liberation is essentially viewed as one of revolutionary "praxis". In the words of Paulo Freire (1970a),

> "one of the gravest obstacles to the achievement of liberation is that oppressive reality absorbs those within it and thereby acts to submerge men's consciousness. Oppression is domesticating. It conditioned social, cultural and communications patterns. To become liberated from it one must emerge from it and turn upon it. This can only be done by means of the praxis: reflection and action upon the world in order to transform it." (pp. 27-28).

With respect to the role of communication in development, David McClelland (1961) and Everett Hagen (1962) have contributed to the theories of entrepreneurship. According to McClelland, the rise of capitalism was due to the fact that Protestantism promoted the need for achievement which in turn fostered entrepreneurship and economic growth. McClelland's theory of development holds that changes in the need for achievement are strong and related to changes in the rate of economic growth. The need for achievement, as opposed to the need for power, refers to an individual's motivation to establish for himself and then to meet demanding standards that are collectively approved. Hagen's theory of entrepreneurship also believes that social structure and economic growth are basically functions of personality and psychological motivation. The typical personality in traditional society is held to be authoritarian, rigid, and resistant to innovation -- one who perceives the world as orderly and manipulative. For economic growth to occur, according to Hagen, something must happen on a fairly extensive scale to change these personality structures. Hagen argues that change in personality occurs when there is a loss of status. Members of a group move toward innovative activities where "the opportunities seem best to exercise one's talent, prove one's worth to oneself and gain social recognition" (Hagen, 1962, p. 241).

Liberal Views of Social and Political Development

The Weberian view of development necessitated a transition from traditional and charismatic authority to rational-legal bureaucratic structures which may be labeled as theories of differentiation (Gerth and Mills, 1958). This school focuses attention on the process of increasing differentation of social structure and functions as the key variables (Almond and Coleman, 1960; Almond and Powell, 1966). This means that as there is an increasing evolution of more different social structures, there is more information available. This variety increases with the increasing complexity of a social system. For a system to maintain growth and equilibrium within itself and other systems, the need for information and communication demands that this process be continued. The telecommunications system, by becoming an "agent" or medium, may assist in this process of transfering information from one system to another. It becomes a new tool.

In contrast, those with a Marxian focus on class analysis and in particular on the role of elites in the process of social change, may be labelled as elite theorists (Mills, 1956; Bottomore, 1964). Following in their footsteps, some have considered the role of intellectual, political and business elites of paramount importance in the process of social change in the less developed countries (Frey, 1965; Tachau, 1974). They concentrate on the increasing professionalization of functions in the process of modernization. The communications aspects of these overlapping and interlocking hierarchies (elites -- differentration of classes) may be viewed as a complex variety of communities which provide diversity and coherence in societies' codes of knowledge and behavior.

The fourth theoretical perspectives have given a special place to the role of communications in the process of social change. These are generally known as mobilization, diffusion, McLuhanist and systems (or information) theories. The social mobilization theories focused primarily on development policy-related topics concerning the role of information in development decision-making (Schramm, 1964); the role of mass media in psychic mobility, cognitive flexibility, and empathy (Frey, 1973; the multiplier effects of mass media in social mobilization (Huntington, 1968).

The mobilization and diffusion theories of communication stress innovative learning. Its main attributes are integration, synthesis, and the broadening of horizons. It operates in open situations or open systems; it derives meaning from dissonance among contexts; it leads to critical questioning of conventional assumptions behind traditional thoughts and actions, focusing on necessary changes. So the needs of innovation are served not by a commitment to past experience, but by reordering the elements newly introduced into a given situation (Friedmann, 1973, 103). Innovation is the restructuring of the element of experience -- it is the creation of a new Gestalt. Rapidly becoming more of a world-wide medium than most people realize, television can reach and touch the lives of increasing millions of people. Its capacity to project images and stimulate new thinking on a global scale is certified by the image of "spaceship earth" broadcasts during the moon landing, or, on a local scale, by the number of examples which attest to the capacity of television to promote education. Many educators are enthusiastic about the technological capabilities of radio, mini-computers and satellite communication systems. With cheap production and easy transmission, these technologies hold out the possibility of true anticipatory and participatory learning.

Among the many approaches to mass media as outlined above, the one taken by Harold Innis (1950, 1951) and Marshall McLuhan (1962, 1964) has gained the greatest popularity. It consists of a series of reflections on media and society. McLuhan holds that "the medium is the message"; in contrast to traditional views of the mass media as merely means of transmission, he maintains that the peculiar attributes of each medium help to determine the very meaning of communication (1964). He argues that each historical epoch is characterized by the kind of media it uses predominantly, and that since Gutenberg, Western thought has been influenced by the principles of uniformity, continuity and linability (McLuhan, 1962). The invention and introduction of other media of communication (telephone, telegraph, radio, television, film) inaugurated a new era which McLuhan calls "the electronic age". The engagement of all senses by the mass media has led to the re-creation of the oral traditions, tribalization of the world, and a new instantly aware global village.

Another theoretical tradition which has proved of longer duration and has been more readily accepted by social scientists and the pure sciences is the cybernetic and information theories merging into a theoretical movement known as General System Theory. This has altered some fundamental theoretical perspectives of social change.

As Irwin Pollock (1968) put it,

> "the concepts and measures of the statistical theory of selective information (information theory) have become so thoroughly enmeshed with the whole of behavioral sciences that delineation of the exact contribution of the theory is nearly impossible. The very verbal descriptive fabric of the behavioral sciences has become so thoroughly interlaced with informational concepts; individuals or groups are described as "information sources" or receivers"; skilled performance is described as "information processing"; memory is described as "information storage"; nerves are described as "communication channels"; the patterning of neural impulses is described as "an informational computer," etc. Indeed, the molecule, the cell, the organ, the individual, the group, the organization, and the society have all been examined from the point of view of a general systems theory which focusses upon the information-processing, rather than upon the energetic, characteristic of each system." (p.331)

The contributions of Shannon and Weaver (1948) and Wiener (1948) marked the beginnings of modern information theory. Shannon provided a scheme for a general communications system which consists of essentially five parts (1) an information source which produces a message to be communicated to the receiving terminal; (2) a transmitter which operates on the message in some way to produce a signal suitable for transmission over the channel; (3) the channel which is merely the medium used to transmit the signal from transmitter to receiver; (4) the receiver which ordinarily performs the inverse operation of that done by the transitter, reconstructing the message from the signal; (5) the destination which is the person (or thing) for whom the message is intended (Shannon and Weaver, 1948).

Shannon's formulation, which originated from engineering concepts, also resembles the model of the communication process called "S-M-C-R-E": a source (S) sends a message (M) via certain channels (C) to the receiving individual (R), who responds or reacts to this stimulus with an effect (E) (Rogers, 1969, 49). This model has met with an important criticism in that it assumes a mechanistic and atomistic approach to the communication process. Much present-day communications research focuses on the effects of the source, message or channel on changes in knowledge, attitude and overt behavior of the receiver -- as if he were passive and lived in social isolation. For this reason, some communication theorists have reversed the question of media effects to ask, rather, what uses and gratifications the audience brings to the media. Others see the process of development essentially as a process of social learning. Some researchers have therefore focused on media ecology and media role in the socialization of the children, from the perspective of human development theories (Comstock and Lindsey, 1975, Vol. 1, 22-23). Other theorists have taken an even broader view. This latter perspective is best expressed by the economist Kenneth Boulding (1966, 6-7) who writes from a system perspective.

The system perspective proposes a new agenda for communication research which includes a "central concern -- with whole societies, their class structure and forms of dominance and an exploration of the role of the media as ideological and signifying agencies within that whole" (Curron et al., 1977, 4). This paradigm of communication research includes those notions of structural organization (ownership and control), ideology (content and intent), and impact (audience and effects) which seem critical from the new perspectives. The technical problems of message design, level of noise and dissonance and selective perceptions of the audience would still have to be considered along with the problem of choice of channels. These constitute the major questions on which communications policy would have to focus. Recognizing both the macro-micro approach to communications research, it is important that policy and planning reflect both aspects. The importance of a theoretical model gives direction and orientation to planners in designing and implementing the appropriate technologies (hardware/software) which best reflect the total environment aspect of a given community. Recognizing the theoretical importance, there is still a need for a theory of social change that will identify the role of mass media.

Changing Paradigms

In writing about communications and development, it is difficult to review different approaches without getting into their fundamental assumption about the nature of social systems (pluralistic model vs. class vs. elite models of societies). Metaphors used by social scientists provide clues for understanding the trends of thought. It seems that mechanical and organic metaphors are being gradually supplemented by cybernetic metaphors, conceiving of society as a complex, adaptive, information-bound, multiple-feedback system (Warren, 1979, 139).

The mechanical metaphors such as the index theories of economic growth see development essentially as a linear progress along certain indices correlating positively with the rise in per capital income. In communications, this metaphor corresponds to the behavioral S-R model, and the Pavlovian and the engineering models to some degree. In the S-R model, the media is conceived as an injector of new attitudes into an essentially passive population. Shannon and Weaver, for instance, conceive of the process of communication primarily in terms of discrete (bit) components devoid of historical and situational contexts. In part, this reflects the Newtonian (the clock of the universe) world view of nature.

The second set of metaphors may be termed organic. Organic metaphors and models of the social system are thoroughly imbued with Darwinian evolutionary concepts. The notion of innovation in much of anthropological research focuses on the psycho-organic effects of the media on the individual. The view of development as an evolutionary process of differentiation of structures and functions with appropriate sets of belief-systems all reflect an organic bias. The Marxian view of history, as an evolutionary progress from lower to higher social orders, also reflects organic biases. Mobilization theories of development betray organic metaphors by viewing development as a process of injection (e.g. achievement motivation, skills, empathy) into the body politic (Bloom, 1966, 185). Some agent from outside must be introduced in order to bring about development.

Through computers, automation and what has come to be known as the post-industrial revolution, the impact of cybernetics or social and industrial life has introduced a new set of metaphors into social science literature. Cybernetic metaphors of the model of society reflect more fluid and less restrictive conceptionalizations of communications and development. Diffusion analysis has taken on a new turn toward network analysis of the communication process; the sociology of knowledge focuses on the varieties of ideological and varying world views which legitimize or challenge the existing social situations. Also, systems models of information, communication and organization reveal an infinite number of possible configurations taking place in social systems.

The impact of McLuhan's ideas has also led to a widening of horizons to look beyond the measurable effects of the media and to focus on the increasing diversity of cognitive styles. The cybernetic perspectives focus on multilinear, rather than unilinear; causality and probability, rather than deterministic. The critical approach to communication and development has focused on a possible alternative to present structures and practices. These critiques include the schooling process (Illich, Freire), medicine and public health (Illich), the technological and production processes (Schumacher) and the analysis of alternative paths to modernization in terms of human costs (Moore, 1967).

The newer tendencies attempt to develop more global models which avoid any linear and deterministic Western bias, but take into account all of the levels of social structure while allowing for different "development" outcome. The older tendency was to turn back to more historically specific and local issues that view the process as one of adaptive responses to changing circumstances. (Keddie, 1977)

While mechanical metaphors and models often lead to notions of primacy of the economic factor in development, organic metaphors emphasize the interdependence of economic and social factors, and cybernetic metaphors put innovation and learning at the centre of the process. Development strategies have also changed correspondingly. Market strategies are being supplemented by national mobilization strategies, as well as placing a new emphasis upon customary, self-reliance, intermediate technologies and liberation from exploitation and domination. The old and new metaphors, mechanical, organic and cybernetic conceptualization of social change complement each other, in that each may be appropriate to a different level of analysis. At the simplest level of analysis of the interaction of stimulis and responses, as of supply and demand, mechanical conceptualizations may be appropriate. Organic metaphors are more appropriate to analysis of the more complex processes of division of labor and differentiation of structure and functions. To conceive of society as a superorganic entity means to see social change in terms of functions of homeostasis. But the essence of social development is invention, innovation, amplification, and change of structure without change of identity. In organic entities (being energy-bound), a change of structure implies loss of identity (metamorphasis), whereas in superorganic stems (being information-bound), changing structures do not necessarily mean change of identity. By development, we mean new configurations of information, communication and organization in a constant process of adaptation to the changing environmental conditions. The challenge of development is therefore to maintain a persistent identity in a process of achieving an increasing order of complexity and innovational capacity. From a normative point of view, the air of the social change process is to provide conditions in which there is the harmonious unfolding of potentialites of each member of society.

This view of development places communications at the center of human meaning, social organization and community development. With this understanding, communication policy must reflect those perceptions and insights obtained from a system point of view and actively direct budgets, education and the development of human resources and telecommunications in order to restructure communities based on information rather than economic benefits. The Telidon and HI-OVIS projects are examples of how social change has been brought about by making significant information easily available to citizens to increase the process of social learning and community building.

An Integrated Approach To Communications Planning

Traditional models of communications have often concentrated their attention primarily upon content, transmission (noise) and effects of message. The tools of content and impact analysis have been stressed without paying too much attention to other aspects of the communication process. Communications research flourished from the mass propaganda era where political analysis, advertising and ratings were the major activities and concerns. Katz (1977a), Harold Lasswell (1927), Paul Lazarsfeld (1948), and Wilber Schramm (1948) were the theoreticians, and research promoters of the field (Lerner and Nelson, 1977).

With the rise of consumer awareness, problems of the developing countries, and concern for the human rights, a second generation of communication researchers has focused its attention on the possible role of communications in social change. Wilbur Schramm (1964), Daniel Lerner (1958), Everett Rogers (1969), and many others provided this generation with its own theories. The great advances of communications technologies and their rigid expansion throughout the world in recent decades has called for a systems approach to research typified by the works of Elilu Katz (1977a), Ithiel de Sola Pool (1974), Edwin Parker (1976, 7), Anthony Oettinger et al. (1977), George Grebner (1969) and research activities of organizations such an UNESCO, OECD, Rand Corporation, East-West Institute, and Aspen Institute.

The present situation has also called for an increasing number of special government departments, research institutes, journals, university programs and schools of communications. In the developing countries, where the challenge of development calls for greater understanding of its cultural processes, a number of research centers have emerged. These include the Asian Mass Communication Research and Information Center (Singapore), Indian Institute of Mass Communication (New Delhi), and Institute of Mass Communication University of the Philippines (Quezon City).

An integrated approach to the problem of communications policy and planning would have to focus on message content and intent, production, distribution and impact in order to evaluate, design and promote a communication system which could assist in the developmental process of communities.

In order to capture the macro-micro aspect of a systems approach to communications, Mowlana (1977a) offers a framework recognizing the linkages and subsystems necessary for an effective approach for analysis.

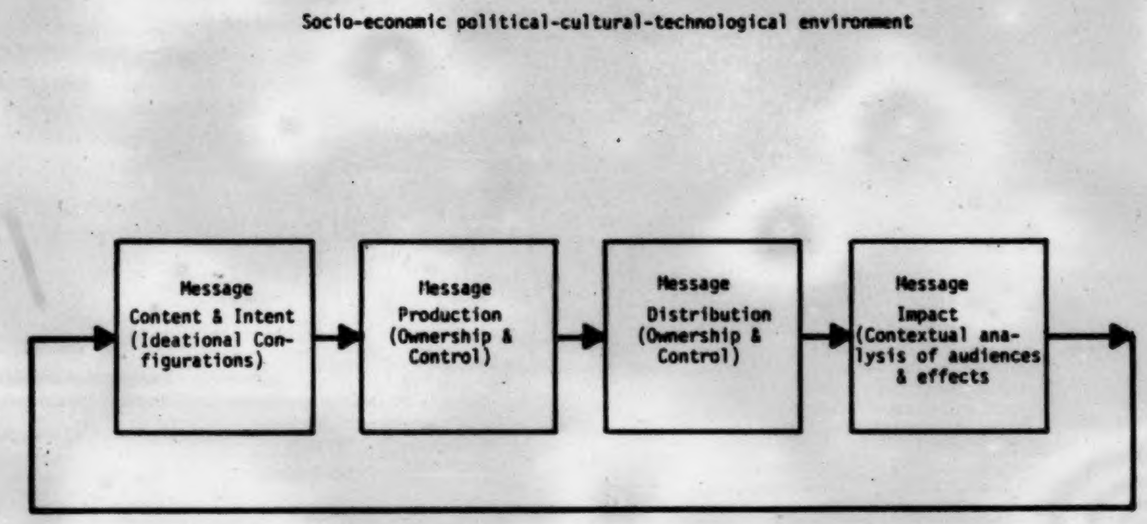
Socio-economic political-cultural-technological environment
Message Content & Intent (Ideational Configurations)
Message Production (Ownership & Control)
Message Distribution (Ownership & Control)
Message Impact (Contextual analysis of audiences & effects

Figure I

Mowlana's framework of analysis recognizes the linkages between the society; a complex structure of economic, political and communications institutions. Given these parameters, it is important to view their interaction within particular markets, with provincial or federal priorities and with public concern as to its sphere of decision making. Though the automony of each sphere varies from country to country or in Canada from province to province, it is generally accepted that the dogmas of Marxism or capitalist commercialism do not hold; all variables in social change are not functions of the economic factor.

A number of different but often overlapping designs have been offered as guides for communication policy and planning (Hancock, 1977; Lee, 1976). Also, Hancock's distinction between vertical, horizontal and cyclical processes of planning is a useful one.

(1) The vertical planning process includes communication development policy formulation, strategic planning and implementation.

(2) The horizontal process of coordination and integration includes planning at the central (national), sectorial, regional and local levels.

(3) The cyclical planning process includes assessing the changing parameters, structures and processes; it is essentially an information feedback process.

System Parameters

The functions of media are traditionally defined to inform, educate and entertain. To these functions we may add those of national integration, social participation and cultural development. We may describe these functions as follows:

1. information function -- to illuminate what is happening in the environment.
2. educational function -- to elevate the level of understanding and adaptive skills in a changing environment.
3. fantasy function -- to ventilate the frustrations and stresses of social change.

4. integrative function -- to maintain and enhance cultural continuity and group identity.
5. participatory function -- to provide channels of communication for social mobilization, and
6. religious function -- to provide a sense of awe and mystification, and a sense of unity with a Universal Consciousness which gives meaning and self-understanding.

Goals and objectives are generally set by the interactions of three sets of parameters: people's needs and expectations; the country's resource constraints and possibilities; and the quality of leadership allocating the limited resources to unlimited needs and demands. From this viewpoint, the business of communications in all fields should be left to autonomous public and private institutions, to community organizations and voluntary associations. As all social institutions are dependent and interdependent, their input adds to the survival of the total system. In essence, the systems view of communications should reflect and educate rather than control and manipulate the forces of development.

Conclusion

Communication systems and theory call for an integrated systems approach to the problems of policy and planning in the two-way video communication technology. In view of the advances of communications technologies (which hold considerable promise in the future in the broadening and deepening of educational opportunities), social participation, the provision of information and entertainment, and the spiritual and affective functions integrate to become the multidisciplinary nature of community. Since social structures are in effect a composite and network information system, the communication theory views information as the core upon which all systems grow, develop and adapt to change. The structure could be called an "information axis"; this perceptual shift suggests that for any social system to grow and develop, links of communication must be maintained and new avenues must be provided to do so. The two-way video system provides those avenues for the informational interactive process to take place. The systems theory calls for feedback to be built into all systems in order for any development to occur.

The Telidon and in particular the HI-OVIS in Japan are the first projects incorporating audio-visual two-way telecommunications with a feedback system. In terms of interactive informational exchange, the learning process and the building of community has been demonstrated to be positive. From this example, communications policy makers and social planners should help match a strategy of an integrated information system which encourages a variety of human needs to be met without constraints. Insofar as feedback or cybernetic metaphors in communications theory respond to a complex interactive society, it is helpful to see social development as invention, innovation, and change of structure without change of identity. Social change in effect means a new configuration of information, communication and organization in a constant process of adaptation to the changing environmental conditions. Feedback allows communities to see where they are going. With some vision, both a direction and a decision become easier and more possible.

The HI-OVIS project attests to the fact that each person in a community can learn from another, and in doing so, can become more of an individual. In effect, the two-way video has become a facilitative information system in which the unfolding of potentialities of each member of the community has been made possible.

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CHAPTER V

COMMUNITY

A central proposition of this section is that the process of communication has a social purpose and is the very activity by which a community exists. To support this proposition, certain basic concepts will be examined.

The concept of community in the development of telecommunication is an important one in the 20th century. In effect, as the communication industry spans man's activity globally, it provides new possibilities of what man can do and how he perceives himself in the changing world. As experiences and meanings broaden, so too does the meaning of one's culture, attitudes, language, and role definition. Words not only retain particular meanings, but also acquire new meanings. As a case in point, it is worthwhile to examine the concept of community.

Community and related words (communication, communion, communes, communism, common) are derived from the Latin root communis - serving and sharing together (Wilden, 1972). "Community", therefore implies a giving and receiving; in other words, descriptively it is double-edged. It describes a quality in the relationship between people within a milieu.

The qualitative nature of the relationships manifests itself behaviourally in a particular social context, and leads to numerous definitions. In particular, Jessie Bernard notes the two types of community as:

> "Among the many different definitions of community that have been offered, three characteristics are usually agreed upon as a minimum, namely locale, shared values and social interaction. The apparent simplicity of this formulation is, however, deceptive. It encompasses two quite different, though related, concepts, one referring to 'the community' and one to 'community'. 'The community' as it is currently conceived usually refers to settlements of the kind encompassed in the definition implied above in which locale is a basic component. 'Community', as distinguished from 'the community' emphasizes the common-ties and social-interaction components of the definition." (1973, 3-4)

Other authors view community like units of social organization and have described those social units as social groups, sub-cultures, institutions. Community can denote "those units of social organization which, depending upon their size, may also be called hamlets, towns, cities, or metropolitan areas." (Poplin, 1972, 3-5)

Hiemstra also takes a locality-based approach to the definition of community, describing community as "a geographical unit organized in such a manner that the fulfillment of normal daily living needs are met" (1976, 67).

Even though the above authors place emphasis on the locality-based approach to the definition of community, Jessie Bernard recognizes the other qualitative aspects of community such as "common ties" based on social values that act as a base for community. Some definitions stress these processes to the extent that community becomes a moral or spiritual phenomenon which can "express our vague yearnings for a commonality of desire, a communion with those around us, the extension of the bonds of kin and friend to all those who share a common fate with us" (Minor and Greer, 1969, 140).

Consistent with this view of community is the notion of shared institutions and values. The shared institutional services constitute a shared way of life, a level of participation on which people come together in significant relationships for the provision of certain living functions. This concept of community attempts to apply social-system analysis to community phenomena, which is based on the idea of structured interaction between two or more units.

Parson described the social system as a

> "plurality of individual actors interacting with each other in a situation which has at least a physical or environmental aspect, actors who are motivated in terms of a tendency to the 'optimization or gratification' and whose relation to their situation, including each other, is defined and mediated in terms of a system of culturally structured and shared symbols." (1951, 5-6)

This is another approach which takes issue with locality, on the basis that the geographical identity of the group is secondary and largely dependent on other factors which form the basis of a common set of objectives. Authors like Wilkinson (1970), Wellman (1971), Reiss (1957) and Roberts (1979) take the view that the essential element of community is communication, not locality. The interaction or mutual transfer of information specific to the group is really the social bond that unifies people. The de-emphasis of locality as the main component in a definition of community is also dependent upon a degree of sophistication in the technology of communication and/or mobility. The telecommunications in recent years have assisted communities towards extracommunity systems. This has come to be called the community action approach.

A community requires a place in time of some duration and a (potentially) creative as well as reactive relationship with the environment. A community must be viable -- available resources must be organized so as to promote long-run survival. This is evidenced by increasingly open communication with external groups, greater internal coherence, and ability of its members to learn. Harold Kaufman (1959) argues that the "community field" is an interactional one carried on by people working together. Greer (1962) considers the effects of the increasing scale of society to be the widening of the radii of interdependence, which means that whether man knows it or not, he becomes a citizen of many worlds. There are no fixed, all encompassing groups to which man is solely oriented. As Daniel Bell states, the purpose of "the post-industrial society has been to enlarge the 'field of relation' and the range of theory so as to permit a new synergism in the discovery and extension of new products and services." (1981, 165)

The entirely new dimensions offered by telecommunication technology represent a turning point in the history of communication. Education by means of television can be vastly expanded; natural barriers to cultural exchange between peoples can be overcome; technical obstacles to the free flow of information can to a large extent be removed. Peter Mann states, "Modern methods of communication make possible a wide psycho-social and territorial range." (1958, 93)

Of all the technological advances that have transformed community, communication systems have played the significant role. Hayden Roberts explains:

> "Advance in communication technology has two effects. The first is to change the nature of communities, from being based on location to being based on communication. It necessitates a move from thinking in terms of a spatial model to thinking in terms of a communication model . . . .

> Communication technology has brought about such a resource of mass media, providing instantaneous information over such a wide area, as to make these spatial dimensions irrelevant. What matters in the formation of a community is the people, roles, and places with whom and with which we can communicate and we can now do this beyond small localities. The important elements in creating a community are: a centre where intelligence or knowledge can be gathered and stored, a code in which this intelligence can be expressed and commonly understood, and a channel by which it can be transmitted both ways. This alone is not of course sufficient; it requires, as well, a commonly agreed purpose. The second effect of advances in communication technology is its ability to provide feedback." (1979, 60)

The development in feedback systems is perhaps the most important instrument as it now makes possible the Wired City, allowing a variety of channels to be available through fibre optics and satellites. In turn, this enables citizens and citizens groups to contribute to the input of information in the formation of public policy and social issues. For example, due to the interactive and feedback system incorporated in the communications technology, Mr. Servan-Schreiber, Minister for New Technology in the Mitterand administration (1980), argues that a universal mini-computer will allow each individual, according to his personality, tastes, and gifts, to find help in seeking the knowledge which suits him and which he needs. The mini-computer will become the basis of international solidarity, linking the technological potential of the developed nations, the human wealth of the Third World and the investment power of the Gulf States (1982).

The definition of community needs to be changed in order to encompass the changes in the communication system. People who perceive social systems as dynamic, ongoing and interacting processes advocate the understanding of community as being such a system, an open, adaptive and innovative one that is continuously in the process of change. Community thus is a dynamic social system requiring information to sustain its growth while at the same time it is a process of learning which must continue in order for the information to be applied appropriately to the social conditions.

With this view of community as a dynamic learning system, the concept of telecommunication becomes a significant agent in the provision, retrieval and acceptance of information for citizens and social interest groups having a common purpose.

Network

Communication is that which ties, links, or connects any element of life together. It permits the establishment of relationships by providing the bonds through which links are created, maintained, and grown. There is the flow of information within this communicative network, and by this, the means of creating a network is also established. In the electronic age, the network has become multi-dimensional and infinite in scope, potential, and probability for people to communicate with each other simultaneously and around the world. In effect, the development in telecommunication has created a quantum leap in bringing information from and to people interactively.

Communication is an essential part of social change, which must ultimately focus upon communication processes. Communication in McLuhan's sense is the ongoing process of creating the world before our eyes from the bits and pieces of information received, rather than just the matching of received data to a socially defined reality as Berger and Luckman (1966) and the symbolic interactionists suggest.

In other words, we have created more networks and those networks and technologies create us. This symbiotic relationship in the communication process makes our social and physical environment active. It is in constant flux. The physical environment we inhabit can be (and has been) fundamentally altered by at least one historical influence: technological innovation. And chief among the accomplishments of technological innovation is the acceleration of information within the environment and hence the intensification and development of social networks. Toffler supports this contention when he states:

> "each new machine or technique in a sense, changes all existing networks, by permitting us to put them together into new combinations. The greater the electronic network combined with alternative structures, the greater the potential social impact." (1980, 26)

This alteration affects consciousness and the social and psychic environments we create and inhabit.

The impact of communication technology in the structuring and designing of networks concerns the broadening and deepening of opportunities for (both vertical and horizontal) social mobility. From this perspective, social and organizational structures are "means" by which man is able to manifest and fulfill his needs, and are not the ends in themselves. Webber (1963) describes these network social systems as "communities without propinquity"; all segments of a national, political and economic web being woven into an increasingly complex social structure in which no person and no group is entirely independent of all other persons and all other groups.

Each person and group bound by a community of interests is integrally related to every other person and group, such that each is defined by its relationship to all others and a change in one induces a change in all. Walter Buckley explains the social interaction model:

> "In essence, the process model typically views society as a complex, multifaced, fluid interplay of association and disassociation. The 'structure' is an abstract construct, not something distinct from the ongoing interactive process but rather a temporary, accommodative representation of it at any one time . . . Process, then, focuses on the actions and interactions of the components of an ongoing system, such that varying degrees of structuring arise, persist, dissolve, or change." (1967, 18)

Paul Bohannan, Professor of Anthropology at the University of California at Santa Barbara, (1980, 36) argues that all of us belong to a dozen or more special-purpose communities. The general-purpose community which came into existence with the agricultural revolution has almost disappeared. Virginia Hine has described such communities in her article (1977). She points out that the old hierarchical organizations based on an organism model are taking a secondary place in the modern world. What is emerging are networks composed of cells of social organization. Each cell is organized differently. The leaders of the decentralized network keep in touch but there is no hierarchy and they have no authority. It is like leadership among the Plains Indians of the nineteenth century. In a given situation, leadership is associated with ability and persuasiveness, not with status or office.

What holds the network together is the idea -- and the idea is the narrow range of issues in which all the members of all the cells of the network believe. Plant (1974) describes these groupings as functional interest groups that have grown out of the industrialization of Western society. He comments:

> "Many theorists are willing to allow for the existence of functional communities. That is to say communities based upon some sense of identity of specific interest which need not imply spatial proximity between those who have the interest in common. Such functional communities trade off the specialized areas of interest generated by the division of labour, a factor which as we saw in the previous chapter, many of the community theorists considered to be destructive of community. Yet here, there are social theorists who argue in terms of communities being linked to sectional interests developed by the differentiation of function -- the consequence of industrialization and urbanization." (1974, 40)

Alvin Toffler (1980) also argues for the Third Wave phenomena becoming a de-massified society. It is growing increasingly difficult -- often impossible -- to mobilize a majority or even a governing coalition. Consensus is limited to a few issues. Post-industrial society attitudes challenge the conventional assumptions about the relationship of majority rule.

Indeed the implications of the breakup of the mass homogeneous society are enormous. Rather than seeing in this enriched diversity an opportunity for human development, people in power and authority view it as "propoganda" and "balkanization" and attribute it to the aroused "selfishness" of minorities.

To recognize and work with the phenomena of diversification of interest, we need to clarify the assumption that increased diversity automatically brings increased tension and conflict in a society. Indeed the exact opposite can be true. Conflict in society is not only necessary; it is, within limits, desirable. Given appropriate social arrangements, diversity can make for a secure and stable civilization. The answer lies in imaginative new arrangements for accommodating and legitimating diversity -- new institutions that are sensitive to the rapidly shifting needs of changing and multiplying minorities. In today's emerging and global scale Wired Society, minorities of interest groups have significant impact on what and how changes are to occur. Also, with the development of telecommunication such as the Telidon (only the beginning), the feedback system is crucial in order to know at any given time in what psychological space people are, so adjustment can be made rather than assuming all men have the same needs at the same time. Today, the very complexity of issues inherently provides a greater variety of interest groups.

Development

New indications of development have come forward, stressing the fulfillment of "basic human needs" and emphasizing the distribution of wealth and other benefits within society. Equality and social justice, autonomy and mass participation in development and the importance of ecological balance in the face of limited and increasingly scarce resources become important development goals (Galtung, 1976). There is a movement towards "self-reliance" in particular in the Third World or from the consensus psychology in the Western World, as a way to break dependency relationships (Pugwash, 1977).

One of Alvin Toffler's key concepts in his book The Third Wave (1980), is the notion of de-massification. Centralized planning is increasingly questioned. If an end of development is to increase mass participation, then centralized planning becomes difficult to justify.

The concept of development incorporating community and information has become important in understanding how information is a building block to the growth, change, and progress of a community.

Information is considered a resource and there is recognition of the political, economic, and social value of information. Information is the basis of all social interaction and thus the very ingredient of the concept of community building.

Communication, the process by which messages are transferred from a source to a receiver, is not only a vital aspect of social change, but also a prerequisite for it. Because information exchange (communication) is such an essential part of social change, an analysis of social change must focus upon communication processes which affect development.

The perspective of systems approach reflects the new disciplines such as cybernetics, information theory and general systems theory. Modern systems theorists closely link systems and structures to information and communication. They view all systems -- inorganic, organic, social systems -- as sets of components or elements (bits) linked in some pattern or configuration by an information communication system. This, in turn, is viewed as a dynamic link and cohesive force which binds any system together. Arthur Clark views all systems and structures as "packaged information" to the point of viewing man as information, and man's biology as only a facility for containing it -- an envelope. He speculates on the interesting possibilities of man breaking himself down into "component atoms" and sending information to somewhere else (Caras, 1980). Walter Buckley (1967) and Ludwig von Bertalanffy (1956) have, in particular, applied the concept of systems theory to the study of socio-cultural system. The model of the socio-cultural system is viewed as an adaptive and innovation complex structure with fluid, ever-changing components which depend on on-going internal and external pressures for some equilibrium. Constant interchange between the various components is what characterizes open systems.

In communication theory and the laws of thermodynamics, the quantity called entropy is the amount of energy transferred from one system in the universe to another. Entropy also is the measure of disorder within those systems. It measures the lack of information about the structure of the system. For our purposes "structure of the system" should be taken to mean "community" (organized) energy.

The First Law of Thermodynamics states that energy is constant: it cannot be created or destroyed; its form can change, but not its quantity. In the strictest sense there are no truly "closed" systems anywhere. All processes infringe upon and are affected by other processes in some way. We can, however, say that a system is "closed" when entropy dominates the feedback process; that is, when the measure of energy lost is greater than the measure of energy gained. The degree of a system's entropy is equal to redundancy whereas its negentropy is equal to kinesis or change. So information becomes energy when it contributes to the self-enriching regenerative wealth of the system. When it's not contributing (redundant), it is allowing the natural entropy to increase.

At the basis of open systems is the concept of feedback. Through the feedback system, information is able to circulate. This concept of feedback (cybernetic) was coined by Norbert Wiener (1948) and further refined by Shannon and Weaver (1949) out of the mathematical theory of communication. Probably the most significant thinking to the concept of feedback of cybernetics is the view that "entropy" or lack of information flows within any structure of a system. This reflects the Second Law of Thermodynamics which states that a system tends towards disorder if it does not receive information. The second law also states that the amount of energy within a local system is naturally entropic -- it tends towards disorder, dissipation, incoherence. And since energy is defined as "a capacity to arrange elemental order", entropy which runs counter to that capacity means less potential for change. We've learned from physics that the only anti-entropic force in the universe, or what is called negentropy (negative entropy), results from the process of feedback. Feedback exists between systems that are not closed but rather open and contingent upon other systems. Change requires energy, and energy is the result of adequate information (Youngblood, 1970). It is also directly proportional to the amount of information about the structure of a system. Norbert Wiener describes information as "name for the content of what is exchanged with the outer world as we adjust to it and make our adjustment felt upon it . . . to live effectively is to live with adequate information." (1967, 26-27)

The phenomena of man, or of biological life taken as a process, is negentropic because its subsystems feed energy back into one another thus creating self-enriching, regenerative processes. A self-enriching and regenerative process continues to change itself in new ways. In the human community, new symbols, myth, language, and technology are given expression and create new gestalt wholes. This in turn creates new social patterns which bring about new thought and ideas, new perspection and action and a reduction of social goals. It means that a community is capable of a much greater proliferation of differentiated functions within its own structure as well as in its relationship to other interest groups. In view of less homogeneity, there is an increasing need for a symbiotic interdependence. Individuals and citizens within the information society concept participate in more specialized, and differentiated aspects of the larger culture and relate on the basis of similarity of interests and specific informational needs rather than simply locality.

The need for information and the manner in which it is accessed, delivered and received changes the very quality and shape of a community. Theoretically this is established by the Systems Theory. That community patterns have changed is partly explained by Warren in the following way: "Communities have grown more differentiated internally, their differentiated parts have become linked with other social systems beyond their borders." (1977, 62)

A thousand threads tie similar units in different communities with other different systems organized for various levels of coordination and control. Communities becoming more interdependent in a type of symbiotic relationship constitute a different kind of community-based unit. This denotes a change in values and in the underlying principles by which people make their choices. Part of these value changes are discussed in Chapter VI.

The change in social structures and functions means that as a social unit becomes more autonomous it becomes more dependent on its diverse social environment for information input and output. Decision-making and community organization take on new structures and functions with information becoming a generating and necessary ingredient in keeping social systems alive. Through alternative telecommunication using the two-way media, social units can be sustained in new ways. As decision-making is made available to more people, information has an entropy-like effect. More information offers more alternatives; more relevant information increases the alternatives to the problem-solving process. If there are more choices available, then learning and social change become more probable.

Commercial entertainment, advertising and one-way mass media may be considered closed systems since entropy dominates the feedback process. To satisfy the profit motive, for instance, the entertainer must give the audience what it expects, which is conditional on what it has been getting. One cannot expect the unknown.

One of the pioneers in the analysis of social organization from a cybernetic point of view has been Kenneth Boulding who describes knowledge as the transformer of social institution when he says

> "Knowledge about the social system is an essential part of it . . . by affecting our behaviour it affects the course of the social system itself . . . as we move towards more secure and exact knowledge of the social system the process of change is likely to accelerate. The role of social invention is likely to increase, and in a relatively short time we may see profound transformation in social institutions and behaviour as a result of cumulative knowledge about the system itself . . . . The key to development is knowledge." (Boulding 1964, 6-7)

The communication process model is best illustrated by the systems approach. Communication is viewed as a process of transportation; the content or meaning of a message is transferred from a sender to a receiver. Hence most information theory concentrates on the analysis of content and the channels or routes of communication within the social group.

For McLuhan, the communication process is not entirely an objective phenomena to be analysed in a detached way. It is the ongoing process of making awareness, of creating the world before our eyes from the bits and pieces of information received. Information is the product of both the symbol or message exchanged and the subject, rather than the matching of received data to a socially defined reality. Data perceived is inseparable from the subject. The exchange process alters both the object and subject simultaneously. This process is probably best described by Ilya Prigogine's idea of the theory of dissipative structure (1977).

Prigogine, who won the Nobel Prize in Chemistry in 1977, argues that dissipation of energy can create a reordering in which a system "relaxes upwards" into a higher level of complexity and coherence, where "the nature of the laws of nature changes." These shifts are sudden and nonlinear caused by multiple factors acting on each other simultaneously. The theory explains "irreversible processes" in nature -- the movement toward higher and higher orders of life. The theory offers a scientific model of transformation inherent in nature (Ferguson, 1980, 63). In community development terms, this means that any new information brings about structure and function changes. There are both a quantitative and qualitative change which affect the nature of the social consciousness of the group to different levels of awareness, perception and social change. Problem-solving and the learning process is viewed from a different order as it were, and then action takes place. There is transformation.

Viewing transformation and development processes in this manner, changes (small or large) may be viewed as sudden happenings.

Even Darwin's notion of evolution happening very gradually, or Charles Lyell's idea of gradualism in geology fall short in modern research. The old paradigm saw evolution as a steady climb up a ladder. The new paradigm attributes evolution and change to periodic leaps. All changes are sudden.

Viewing system analysis with the theory of dissipative structure of Ilya Prigogine offers insights into the developmental process of community. The changing process is altered by the interaction. The behaviour of a small group of people or community can completely change the behaviour of the group as a whole. As each member of a social unit is linked with a total system, the survival of one unit is equally dependent on others. Each influence and affect the other. For example, a small national group in Iran helped create a global energy crisis.

This concept of change suggests that the image of modern society needs to be revised to one which can reconcile the network of interconnected individuals with the interaction and communication which occur for different reasons, at different times, for different purposes. Therefore, society can no longer be viewed and conceptualized as being comprised of large, undifferentiated masses waiting to receive messages injected by mass media systems. Klapper (1960) sees the effect of media as serving and reinforcing whatever predisposition its audience already has. Information must be delivered contextually or situationally if it is to be effective. This approach reinforces the notion that the "neutral informational symbols" for the masses does indeed have little effect. Symbols must be defined and understood to have any social sigificance.

This contextural trend is now at the forefront of research in mass communication. Older orientation which focused on stimulus-response kinds of relationships has now given way in light of observed phenomena and interdisciplinary research.

Information and communication theory believes mass media and society must therefore be viewed as a total social interactive system recognizing the set of social and cultural conditions that is the society itself. This perspective allows for the viewing of the relationships between the various components of the "sub-system" of the larger social system which makes up a society. This approach also recognizes that the structure of each system of mass communication is influenced by the general social, political, economic and cultural conditions during its period of development. In DeFleur's words:

> " . . . no medium of mass communication exists in a social vacuum. It is linked inextricably to complex and changing cultural contraints." (1970)

To Levi-Strauss as well as McLuhan, the media is itself a cultural innovation. It is transformational. It generates ideologies and mystiques of its own that intermingle with social relationships of all kinds (Lefebre, 1977). From the time they occur, they are irrevocably in existence, and affect just as inevitably the structure of society from that moment onward.

Alexander Graham Bell, Henry Ford, Thomas Edison and their innovative technologies have transformed our world. Cherry (1980) shows us how innovations in communication have completely altered the nature of communication itself and in so doing have created a different culture. Schramm (1966) sees each medium of mass communication as being inextricably bound to the complex and changing cultural constraints of the society of which it is a part. A social system like mass communication reflects the economic, religious, social, and political structures within which it operates. Each new communication technology interacts with the total social system and serves as a force bringing social change. Both the hardware and software are equally important in bringing this about.

Viewing mass media in Marilyn Ferguson's or Alvin Toffler's terms, we can understand that one of the most notable features of our telecommunications system is its continuous change since it is both a diffuser and a receptor of information (2 way system). In the process, it alters both sender and receptor due to the exchange of information, and social relationships move to a higher and more complex level. Social system and information theories view the exchange of information and communication as an essential requirement to community development. This continuous exchange adds new information and thus changes the character and quality of social groups. The dynamic interplay of a group in Homan's (1950, 138) terms is with its two major tasks: first the group's activity and those of maintenancy function, and second, the group's relationships with other groups. The maintenancy function includes the external system, which, in Homan's terms means formal organizations which social systems are dependent upon, e.g., educational institutions, seminars, research and development programs, research institutes, etc. Again these formal organizations are becoming less homogeneous and more varied in their services. Due to organizational changes and new informational suppliers, information becomes more available and more accessible. In effect this changes the very ways and patterns people have been used to. Partly this is brought about by the capacity of media development in accessing information and delivering it to the home or the office; the total environment has become to be a "university without walls." Just as monasteries were at one time centers of learning and information gathering, the universities played this role in the industrial societies. They became centers of high capital costs of little relevance to the surrounding communities. It would appear that in the 20th century, information sources will be electronic and disidentified to a particular time, place, and location.

A theory of social change was introduced by McLuhan. His belief was that technology of communication is central to all other technology and affects all social organization and culture. This kind of technology supercedes the others because information is involved. It is transmitted, created, sent to and received from people. These telecommunications technologies are in effect "extensions" of man (McLuhan, 1964). As mechanical technologies are extensions of the limbs and organs, electric technology is an extension of the central nervous system. McLuhan writes:

> "With the arrival of electric technology, man extended, or set outside himself, a live model of the central nervous system itself." (1964, 53)

> "It is a principal aspect of the electric age that it establishes a global network that has much of the character of our central nervous system. Our central nervous system is not merely an electric network, but it constitutes a simple unified field of experience. As biologists point out, the brain is the interacting place where all kinds of impressions and experiences can be exchanged and translated, enabling us to react to the world as a whole. Naturally, when electronic technology comes into play, the variety and extent of operations in industry and society quickly assume a unified posture."

> "Automation is not an extension of the mechanical principles of fragmentation and separation of operations. It is rather the invasion of the mechanical world by the instantaneous character of electricity . . . "

> "Our new electric technology now extends the instant processing of knowledge by interrelationships that have long occurred within our central nervous system." (1964, 302-03)

> "The important thing is to realize that electric information systems are live environments in the full organic sense. They alter our feelings and sensibilities, especially when they are not attended to."

> "This is the principle that applies to all technologies whatever, explaining the pathos and impercipience of historical man. Since the new information environments are direct extensions of our own nervous sytems, they have a much more profound relationship to our human condition than the old 'natural' environment." (1968, 36-7)

The extension of our physical and sensory capabilities by technological innovation alters our physical-cultural environments. The altered mix of sensory impacts affects our consciousness, and in turn alters our social environments. This effect of technology upon consciousness is instantaneous, re-creating our psychic and social environments and influencing the nature of our new social connections, their meaning upon us, as well as our collective physical environments.

McLuhan argues that the interdependent and mutual relationship between communication processes and the electronic information technologies determine, shape, and give direction to which communities, societies, and culture become new identities. McLuhan strongly argues that not only does content of information affect change; the carrier or the transporter of information also shapes the way organizations, institutions and communities are structured. Many communications experts share this view.

McLuhan writes

> ". . . any extension of the sensorium by technological dilation has a quite appreciable effect in setting up new ratios and proportions among all the senses." (1969, 48)

> ". . . when sense ratios change, men change. Sense ratios change when any one sense or bodily or mental function is externalized in technological form." (1969, 314)

> "Any invention of technology is an extension . . . of our physical bodies, and such extension also demands new ratios and new equilibriums among the other organs and extensions of the body . . . As an extension and expediter of the sense of life, any medium at once affects the entire field of the senses." (1964, 54)

> ". . . All social changes are the effect of new technologies on the order of our sensory lives." (1968, 5)

Other adherents to the new academic discipline of "futurism" such as Alvin Toffler, Jacque Ellul, Peter Drucker, Lewis Mumford, Daniel Bell, Aldous Huxley, describe a society of the future which will be built and shaped by new technology. What is unique and brings some hope to the human condition is that the "futurists" believe in the deliberate intervention of human instruments to control change for specific purposes. With the growth of modern communication and transportation, we are made aware of our output instantly as it affects people across the street or across the world. The system of interactive feedback and cybernetics illustrates and indicates the consequences of our behaviour. Choice, planning, and the designing of our social and physical environments to have alternative futures necessitates our need for interdependent relationships and expands our meaning of community.

This is our increasingly information-dependent society; there is a need to view the development of our communities as a "negentropic" force improving communication. The improvement of communication creates a sense of our existence in the continuity which links our individual futures to our individual pasts. We depend ultimately upon others for confirmation of that continuity at every present moment. To be, we must exist in some social context. This social context or society is more complex depending on the degree it is civilized. A simple human society is one in which the knowledge required for membership is coherent and homogeneously distributed. A complex society is heterogeneous and offers different paths to membership. To function adequately in a complex heterogeneous society, one needs to know more and more. Knowledge and ways of knowing become specialized. Wiener (1950) points out that the process of receiving and of using information is the process of our adjusting to the contingencies of the outer environment and of our living effectively within that environment. The needs and the complexities of modern life make greater demands upon this process of information than ever before . . . to live effectively is to live with adequate information.

Development is a combination of information exchanges, social meanings interacting within a social network which bring man to the present challenges of post-industrial society. Goulet points out:

> "As a result of broad ecological, social, and symbolic processes, man's image of himself and of the world is transformed. His instincts, mind, genetic potential, societies and symbols are all modified. The collective knowledge now possessed by the human species can transcend parochialism of time and space.
>
> Man's altered relationship to time and space introduces new dimensions into his awareness. Moreover, psychic and social transformations are paralleled by unprecedented ecological changes as a result of which the total environment becomes increasingly man-made, not natural. Not suprisingly, he finds it necessary to redefine

> himself and his roles. Even man's psyche, to say nothing of his body, can no longer by viewed as part of nature or as a mere physiological entity. Like his environment, man himself has become a technically manipulable artifact." (1975, 187)

Whatever its effects in our increasingly complex world, information is becoming the basic building block of a society which places increasing emphasis on the production and distribution of information. It is not difficult to conclude that if there is one salient fact about information technology and its role in the delivery of and access to information by citizens, it is that it is bound to produce enormous social change -- a change in human consciousness and therefore a change in the quality of life.

The clash between the two value constellations -- old and new -- causes the difficulties from which we now suffer. Declining in importance are values developed by the clock-dominated industrial society, such as time-splitting mass production, fast "economical" transactions, time "saving" processes, hectic movements. Ascending are values enhancing human life and its quality, as well as those related to human community and its interactions. Some of the new issues reflecting changes of values are concerns about procreation of life, community life, environment, understanding and sharing, multi-dimensional thinking and spiritual concepts. This will not evolve by itself, but will depend on the re-direction of creativity depending on the active involvement and participation of all groups.

The electronic technology is so different from that of older industrial technology (print), that its impact is quite different. It is instantaneous, simultaneous, "all at once"; its extremities are receiving messages as quickly as the center; the exclusivity of information (which is the foundation of centralization) is dissipated. McLuhan has argued that this technology promises a promotion of a more egalitarian society. Many adherents to this view predict that the technology of tomorrow could open up and enter a new range of social and political opportunities that will generate the most profound changes in human history within the next few decades.

The electronic technology has put people together. It has increased our social consciousness to new levels of awareness and our interdependence with the human community. In fact, in keeping with what prophets, mystics and new physics reveal about the nature of matter etc., the human community is one whole. Although we are still operating, thinking of, feeling and perceiving the world as if it were all separated, the new technology forces us to re-evaluate our present goals, ideals and objectives. Our value system is at stake, as emerging political, educational, health, energy, transportation, trade, and industrial development issues must now be viewed from a different perspective.

Alvin Toffler, another proponent of this position, describes the organizational upheaval and collapse of hierarchy which he feels characterizes a post-industrial society:

> "We are moving from bureaucracy to ad-hocracy . . . we are witnessing a revolutionary shift in power relationships. What is involved in such a shift is a virtual revolution in organization structure and human relationships." (1970, 123)

Paul Bohannan argues that the old hierarchical organizations based on an organism model and run by a bureaucracy are taking a secondary place in the modern world. What is emerging are networks composed of cells and social organizations. Each cell is organized differently. The leaders of the decentralized network keep in touch but there is no hierarchy and they have no authority. What holds the network together is the idea -- and the idea is the narrow range of issues in which all the members of all the cells of the network passionately believe.

Pierre Teilhard de Chardin, the religious philosopher who reflected on the evolution of men, used the term noosphere (from the Greek root noos: mind). He visualized the earth in a sphere of channels for the immediate interchange of thought, information and intellectual operations. He writes:

> "All around us, tangibly and materially, the thinking envelope of the Earth -- the Noosphere -- is adding to its internal fibers and tightening its network: and at the same time its internal temperature is rising and with this its psychic potential." (1964, 132)

Today, we are beginning to build networks with multiple paths like spiderwebs which interconnect computers and computer-users. These networks are spreading worldwide and will become accessible from the home, possibly via a color television set with a keyboard added. While the networks are spreading, computers and information storage are dropping in cost at a phenomenal rate, and will continue to do so until powerful computers become as common as telephone sets. This development in telecommunications opens new doors for more possibilities for all citizens to be linked to whoever and whatever they wish.

Thus, as a result of improved technology, more people can communicate more things to others more effectively. Toffler writes:

> "The advance of communication technology is quietly and rapidly de-monopolizing communication . . . technical breakthroughs have altered the economics

> of television by producing more channels and lowering costs of production . . . This medium too is therefore beginning to fragment its output and cater to increased diversity . . . The invention of electronic video recording, the spread of cable television, the possibility of broadcasting direct from satellite to cable systems, all point to a vast increase in program variety." (1970, 249)

The need for structural change to accommodate new interactions is apparent. This development of the electronic community has opened the way for new sources of goods and services: cooperatives, barter, mutual-help networks. Pooled resources make everyone richer; pooled information makes everyone the producer and consumer of information.

The cybernetic effect of information put an end to causal connections (visual bias) and has created new communities and a social milieu where learning and readjustment have become the new life style. This was made evident with Telidon and HI-OVIS projects. Initially specific kinds and levels of information were provided to participating citizens, but as the system became easier and more operational, more and new information was demanded by citizens. As the hardware increased, the original software or technical capacity to handle information was in short supply. As society becomes more complex, more information will be continually necessary for the system to hold together. The two case studies of two-way communication in practice have become the operational basis for communication theory in that they have shown that a feedback system is crucial in the building, maintenance and growth of communities.

The two-way communication utilization in effect increases the possibility of having information and human experience be better known and understood by others by bringing about a new way for information to be sent and received. As this is a way of thinking as much as it is a way of doing things, it creates cultural changes in that communication channels in a community alter the very nature of community organization and social action. This ends the old mechanical pattern of setting up communication systems in lineal sequences and puts the local community into a global setting. An organic unity is created making all communities interdependant and information bases for each other. Specifically two-way video information flow cybernetically makes information new and negentropic, thus becoming the basis for social changes in a community.

Conclusion

Cultural norms and roles are constantly being re-defined. We have become cognizant that identity has been confused with our body (biological) or our cultural system. With the interface of more information, the transformed self breaks out of the compartments structured by cultural role assignments, not only by acknowledging aspects long suppressed but also by recognizing how the assigned traits can become distorted.

New developments via the technological media continue to influence individuals in interacting and finding new opportunities for expression. Conventional terms of relationship -- husband, wife, father, son, daughter, lover often mask our authentic selves rather than identify us as persons by trying to match our behaviour and feelings to the "job description".

Social institutions must be transformed, but the social change must occur at the same time the development of the self emerges. This circumstance requires man to search for new meanings and a creator of new patterns. This new ecological environment has changed its context from geographical to intentional and interest communities.

Probably the most significant factor in the process of social change is the concept of cybernetics and information theory which reveals that a constant interchange (feedback) of information between various components of open systems is the basis of purposeful behavior. Media de-fossilizes information and makes it fluid and dynamic. It breaks down our illusions, our walls and need for privacy. Thus information is seen as contributing to a system's maintenance, reducing entropy and resulting in change.

Perhaps as community development workers, we must create "wars" and transform our socio-ecological-physical world. The two-way interactive video makes us aware of the instantaneous world by unifying all communities into an entire global culture. The implementation of this concept is indeed beyond the scope of this thesis, as the range of opportunities have not as yet been realized.

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CHAPTER VI

WIDER VISION

"Where there is no vision, the people perish." (Proverbs 29, Verse 18)

New information arising from different disciplines provides a new paradigm which enables people to interpret experiences and interact within dynamic and changing environments. Innovations from many disciplines such as physics, social sciences, comparative religion, evolutionary theory and biological engineering are part of the current cultural make-up which views matter, energy, physical, and social systems to be in a constant evolutionary process. These innovations offer a valuable insight into how the dissemination of information gives rise to new awareness, influences policy, and results in social change. New information about our environment broadens our vision and leads us to view telecommunication potential from a different frame of reference.

The purpose of this chapter is to investigate some of the common and broad themes similar in various disciplines, and then show how our understanding affects the way we design, operate, manage, and implement policies which in turn affect the way we view telecommunications. In addition, as vision and understanding are implicit in all our behaviours, the purpose of this chapter is to articulate and show how new information is a direct link in the change of mass media communication from one-way to two-way interactive systems incorporating some of the community development principles.

Community development has always been concerned with human relationships, the focus being on the quality of relationships and the patterns which these relationships take. Social change, focusing on sequences of human interaction and bonds, happens in social groups, and in the community (Ogburn, 1950, 343-346). All the intellectual, cognitive, affective, cultural, spiritual aspects are in various ratios, and are important components in making human relationships qualitatively meaningful and the bases of community building.

Indeed, electronic telecommunications, if seen as a purely extraneous and technical kind of universalism for global cooperation, may be considered as a major structural change in the way information and human meaning is transferred from people of a particular kind of social consciousness to another individual or group of people with another kind of social consciousness. Thus the means of bringing about unity lies not only in further development of mechanical collectivities on a planetary scale, but the development, transformation and transcendence of human consciousness.

Changes in social consciousness rest upon the hypothesis that cognitive, attitudinal and subjective changes are necessary antecedents to behavioural changes. Roger Garaudy in his book L'Alternative (1972), argues for such change in the creation of a new society where information and learning become the key issues in human survival and social transformation. If the results of advertising (Johnson, 1970) and UNESCO's research (Garaudy, 1972) are any indication, then the potency of mass media as a medium for learning is tremendous. The learning processes and activities are partly shaped and motivated by the paradigms we hold to be true. Yet amongst the drastic and frantic proliferation of material good, ecological exploitation and fragmentation of knowledge, contemporary Western societies are experiencing an overwhelming sense of confusion and disorientation because they do not have a framework or paradigm in which their experiences and new knowledge can fit. Innovations in physics, social science, comparative religions and systems theory, evolutionary theory, space travel, biological engineering, and the speed of the telecommunication industry currently are part of our experiences, cultural make-up, and world image.

Men like Norbert Weiner, Buckminster Fuller, Alan Watts, Teilhard de Chardin, and Daniel Bell all remind us that whether we like it or not we are responsible for the future, not only of ourselves, but of our societies, our earth and the cosmos.

Some general trends are already visible and exert a great influence on our thinking processes and awareness. The need for a wider vision of who we are and what we can do and become, surprisingly results from many fields of enquiry which perceive all energy, matter, systems (molecule to galaxy) and human enterprises as one interdependent organism seen from different perspectives. The modern conception of nature is seen as a continuous evolutionary process linking the physical with the biological, the biological with the psychological and the psychological with the social, moral, artistic, and religious experience of man (Harris, 1958, 57-58).

Emphasis in the emerging fields of science is upon interdependent systems which focus on the unitive nature amongst and within all systems (Capra, 1975; Chew, 1968; Needham, 1956). This unified theory, known as or termed "bootstrap theory", (Chew, 1968) contains the premise that everything in the universe is connected to everything else.

Mapped out in the following chapter is an overview of how current research views man and nature as an interdependent system which seeks to understand the relationship of the part to the whole and the whole to the part. Involved is a fundamental reorientation of modern man's Weltanschauung, or world view, which is shifting to a view of himself and his planet as one interdependent organism. This is the vision now emerging in modern medicine, psychology and physics. There are similar and complementary concepts between Systems Theory and communication, viewing information and communication as essential components to the growth and function of community development. This was discussed in Chapter IV. In Chapter III, the discussion of the development of technology in the telecommunication industry attests to the fact that two-way information flow is designed to allow citizens input into the information flow. This concept of the two-way flow of information is relevant to the feed loop system as reflected in other disciplines. Based on awareness of the essential interrelatedness and interdependence of all phenomena, this chapter will investigate and indicate the relevance of the following areas:

A. Modern Physics and Eastern Mysticism
B. Left and Right Hemispheres
C. Holism and System Theory
D. Consciousness

A. Modern Physics and Eastern Mysticism

Twentieth century physics does have a profound influence on philosophical thought, because it has revealed the limitations of classical physics and has forced change in some of our basic concepts. In classical science nature was seen as a mechanical system composed of basic building blocks. The concept of matter in subatomic physics is totally different from the traditional material substance of classical physics and the same holds for concepts like space, time, causality. These concepts are fundamental to our outlook on the world around us and with their radical paradigm changes, our whole view has begun to change.

These changes brought by modern physics seem to lead towards a view of the world which is very similar to that of Eastern mysticism. The parallels between the principal theories of modern physics and the mystical traditions of the Far East can be found in The Tao of Physics (Capra, 1975), Mysticism and the New Physics (Talbot, 1980), and The Dancing Wu Li Masters (Zukov, 1979). The recurring themes of Eastern mysticism which are parallel to the world view of modern physics are (1) the unity and mutual interrelationship of all things and events and (2) the dynamic nature of the universe. The notion of a fundamental interconnectedness of nature arises in quantum theory which is closely related to the Eastern conception of the material world.

This view has necessitated a radical revision of many of our basic concepts. In this section of the chapter a theme of unity and mutual interrelationship of all things and events will be discussed. After a brief juxtaposition of classical physics and the organic view of Eastern myticism, a further elaboration will be made of the interconnectedness of nature with the parameters of quantum theory and how it acquires an essential dynamic character in relativity theory.

Science and myticism are two complementary manifestations of the human mind, of its rational and intuitive faculties. The modern physicist experiences the world through an extreme specialization of the rational mind; the mystic through an extreme specialization of the intuitive mind. The two approaches are different, but as messages are coded differently by the brain, man needs both to be fully human. If both modes of information are needed, then the information society and two-way communication must include both the intuitive and the analytical styles of information. This is discussed in the section on left and right hemispheres.

The exploration and investigation into different avenues of human experience is at the same time a recognition that different modes of information and communication are essential to the functioning of a given system. Further exploration not only broadens our vision of ourselves but also can assist community developers in the planning and development of communities.

A brief exploration of the mechanistic world view of classical physics and the organic view of Eastern mysticism will show how both view the material world in similar ways, arriving by different disciplines.

Mechanistic and Organic World Views

Classical physics has a mechanistic view of the world. It has roots in the Greek atomists who saw matter as being made of "building blocks". Atoms were viewed as different from matter. This image, which became part of the Western way of thinking, gave rise to the dualism between spirit and matter (Tremontant, 1960). Later this dualism was formulated in the philosophy of Descartes who based his view of nature on a fundamental division of mind and matter. This allowed scientists to treat matter as dead and to see the material world as a multitude of different objects assembled into a huge machine. Such a mechanistic view of the world was held by Newton who made it the foundation of classical physics.

Opposed to the mechanistic view is the one of the Eastern mystics which may be characterized as "organic", as it regards all phenomena in the universe to be integral parts of an inseparable harmonious whole. For the Eastern mystics, all things and events perceived by the senses are interrelated, connected, and are but different aspects of the same ultimate reality. Our tendency to divide the world we perceive into individual and separate things, and to experience ourselves as isolated egos is seen as an "illusion". For the Eastern mystics the world is fluid and everchanging, it is dynamic. The cosmos is seen as one inseparable reality -- forever in motion, alive, organic -- spiritual and material at the same time. Motion and change are essential properties of things. This view is analogous in modern physics to the Quantum Theory. (Walsh, 1979, 64)

Quantum Theory

The physical world, according to quantum theory, is:

> . . . not a structure built out or independently existing in analyzable entities, but rather a web of relationships between elements whose meanings arise wholly from their relationships to the whole (Stapp, 1971, 1303).

The concept of quantum theory, by Rutherford's experiment with the property of matter and light, had shown that atoms, instead of being hard and indestructible, had a dual aspect. They appeared sometimes as particles, sometimes as waves. In 1901, Max Planck, professor of theoretical physics at the University of Berlin, showed that light did not emit heat radiation continuously, but rather in the form of "energy pockets". These energy pockets, which Einstein called quanta and are now called photons, are massless, always travelling at the speed of light. At the subatomic level, matter does not exist with certainty at definite places but rather shows "tendencies to exist". These tendencies are expressed as probabilities.

Henry Stapp (1971) has emphasized that these tendencies or probabilities are not probabilities of "things", but rather probabilities of interconnections which take the form of particles or waves at the sub-atomic level. Quantum theory thus demolished the classical concepts of solid objects and of strictly deterministic laws of nature. It revealed a basic awareness of the universe and showed that we cannot decompose the world into independently-existing small units (Capra, 1975, 71). As said by Niels Bohr (1934, 57), "Isolated material particles are abstractions, their properties being definable and observable only through their interactions with other systems."

Quantum theory forces us to see the universe not as a collection of physical objects, but rather as a complicated web of relations between the various parts of a unified whole. Werner Heisenberg (1963, 96), for example, wrote:

> "The world thus appears as a complicated tissue of events, in which connections of different kinds alternate or overlap or combine and thereby determine the texture of the whole."

This, however, is the way is which the Eastern mystics experience the world, and they often express their experience in words which are almost identical to those used by atomic physicists. For example the following quotation from Tibetan Buddist, Lama Govinda (1973, 93):

> "The external world and inner world are for (the Buddhist) only two sides of the same fabric, in which the threads of all forces and of all events, of all forms of consciousness and of their objects, are woven into an inseparable net of endless, mutually conditioned relations."

These words by Govinda bring out another feature which is of fundamental importance both in modern physics and in Eastern mysticism. The universal interconnectedness of nature always includes the human observer and the process of interconnectedness that lies in his consciousness. The crucial feature of quantum theory is that the human observer is necessary to define properties of the interconnections. In atomic physics, we can never speak about nature without at the same time, speaking about ourselves. As Heisenberg has put it (1963, 75), "Natural science does not simply describe and explain nature, it is a part of the interplay between nature and ourselves."

In modern physics, then, the scientist becomes involved in the world he observes. John Wheeler (1974) sees the involvement of the observer as the most important factor in quantum theory and therefore has suggested replacing the word "observer" with the word "participator". The notion of the participator is thus basic to the mystical traditions of the East. The increased awareness of man's physical and spiritual interdependence with the world he lives in leads to a profound social transformation. With an awareness of multiple realities, we lose our dogmatic attachment to a single point of view. A new sense of connection with others promotes social concern and action. In discovering our autonomy we become more intense in our participation. The focus becomes clearer, and the determination to change the community becomes more acute.

Relativity Theory

First, the theory of relativity is not a theory that everything is relative. It is a theory that appearances are relative in that they are dependent upon the state of motion of the observers. The theory of relativity also tells us that space and time are not two separate things, but together form space-time, and that energy and mass are actually different forms of the same thing -- mass-energy. Mass is nothing but a form of energy; every object has energy stored in its mass. In modern physics, mass is no longer associated with a material substance, and hence particles are seen as bundles of energy rather than consisting of any basic "stuff". Since energy is associated with activity and processes, the implication is that the world is intrinsically dynamic and unified.

An example which illustrates and demonstrates the unity and dynamic nature of matter in experimental terms is the Einstein-Podolsky-Rosen experiment which shows that much atomic particle activity occurring at a specific time and place simultaneously affects other particles in another location (distance). The strange phenomenon of events here simultaneously affecting the events everywhere, (Zukov, 1979, 286), is known as the Einstein-Podolsky-Rosen (EPR) Effect (Zukov, 1979, 286). This experiment as a scientific piece of information reflects the intuitive knowledge of mystics that the world is one harmonious whole (cosmos). With instantaneous communication, the global city is really the actual articulation of this basic reality. In effect, further developments in high technology could and may assist in the restructuring of the conscious experiences of man to become similar to the experiences of mystics and those elements of the archetypes in the unconscious.

According to the usual ideas in physics, information is carried from one place to another by a signal; without a carrier there is no communication. Traditionally physics has rested on the assumption that nothing in the universe can travel faster than the speed of light. However, the Einstein-Podolsky-Rosen Effect indicates that information can be communicated at superluminal (faster than light) speed contrary to the accepted ideas of physicists.

This view of modern physics argues that the world is fundamentally united in ways which somehow allow faster than light connections between apparently separate "parts" of physical reality.

Stapp wrote,

> "Quantum phenomena provide prima facie evidence that information gets around in ways that do not conform to classical ideas. Thus the idea that information is transferred superluminally is, a priori, not unreasonable." (1977, 191)

Everything we know about nature is in accord with the idea that the fundamental process of nature lies outside space-time but generates events that can be located in space-time. The theorem of this paper supports this view of nature by showing that superluminal transfer of information is necessary. Existence of matter and its activity cannot be separated (Suzuki, 1959, 33).

The Eastern mystics are aware of the intimate and dynamic connection of the world, like the modern physicists. Suzuki (1968a, 33), writes: Buddhists have conceived of an object as an event and not as a thing or substance.

Modern physics thus exhibits all the main features of the Eastern world view. Quantum theory has abolished the notion of fundamentally separated objects and has come to see the universe as an interconnected web of relations. Relativity theory has made the cosmic web dynamic by showing that its activity is the very essence of its being.

The experiences and perceptions of both the Eastern mystics and modern physicists increases our awareness more broadly and deeply than anyone had guessed. Both the objective and subjective world are interconnected; matter-energy-man are as one. Man is not isolated. This view challenges man's role as a conscious participator and agent for social change. In other words, his action or inaction affects other people across the street or across the world. Telecommunications causes man to become conscious of the fact of his interconnectedness and literally makes new human connections which were previously not possible. In reshaping social order due to new awareness, the impact of such a technology can be far greater than what we may perhaps have imagined.

B. Left and Right Hemispheres

Since 1961, substantial interest has been focused on the asymmetry of the cerebral hemispheres, first by neurophysiologists and other biomedial researchers and lately by social and educational researchers. In 1962, Dr. Sperry (at the California Institute of Technology) performed a series of operations on patients suffering from epilepsy. The experimental operation was to sever the corpus collosum, the principle direct link between the left and right hemispheres (1975, 31). This has become known as the split-brain syndrome and has precipitated a flood of studies on hemispheric asymmetry of function. It is also referred to as hemispheric dominance or what Julian Jaynes refers to as bicameral mind (Jaynes, 1976). The diagram below gives a fairly reliable summation of the findings in various studies and reports from respectable sources as Penfield (1976), Sperry (1975), Gazzoniga (1975), Luria (1970), Livingston (1969), Pines (1973), and Trotter (1976).

Because written permission to reproduce was unavailable, the graph on brain functioning has been deleted.

The human brain is divided into two hemispheres, the left and the right, joined in the centre by a large nerve called the corpus collosum. When this nerve is surgically sectioned, information received by one hemisphere is not known to the other, and patients have two uncoupled minds in a single skull. Most of the left eye, the left ear and the left-hand side of the body is connected to the right brain. Most of the right eye, the right ear and the right-hand side is connected to the left brain. The two hemispheres process information in unique and contrasting modes.

We note that in the right hemisphere, which governs the left side of the body, we find spatial/musical, holistic, artistic, symbolic, simultaneous, emotional, intuitive, creative, spiritual, receptive, synthetic, gestalt, facial recognition, simultaneous comprehension, perception of abstract patterns, recognition of complex figures, and sound. In the left hemisphere, which governs actions on the right side of the body, we find, speech/verbal, logical, mathematical, linear, detailed, sequential, controlled, intellectual, dominant, worldly, active, analytic, reading, writing, naming, sequential ordering, perception of significant order, complex motor sequences.

While the left hemisphere is generally considered to be the site of language activity, researchers have recently found that the right hemisphere also generates a limited spoken vocabulary - mainly expletives, commands, and simple emotive sentences. The two hemispheres depend on each other quite closely, and in healthy individuals, work neither in isolation from, nor in opposition to each other. The healthy adult can both perceive a gestalt and discuss it intelligently.

Some Implications

Through various laboratory techniques, researchers have further refined the differing skills of the two hemispheres. With patients, in whom the corpus collosum has been severed through accident, and with healthy individuals monitored by an electroencephalogram (EEG), they have found that the right hemisphere is most actively engaged in processing information such as tone and voice, rhythm and melody, completion of patterns, rhyme and harmony. Also the right hemisphere plays a more important role in emotions than does the left and is primarily involved in involuntary memory. Obviously, advertisers have benefited from the findings about the right hemisphere with all its non-critical, non-analytical aspects. The right hemisphere, which is the hemisphere of sound and resonance and things visual, is the appropriate hemisphere for the electric age.

What the scientists are discovering is that although speech originates in the left hemisphere, there is still a vestigial speech area in the right hemisphere from which comes hallucinations of a person hearing speech: his mother yelling at him, his father giving him orders, etc. The hallucinatory speech frequently deals with works of wisdom that deal with human conduct, such as the scriptures citing the prophets as quoting "Yehwey say . . ." Or the parent-voice in transactional analysis . . . "I can hear my mother telling me, "Never, never do . . .","" or what Jaynes calls the collective imperative (Jaynes, 1976, 328).

McLuhan (1967, 55) has recognized the critical relevance of the new field of research and has written:

> "Because the dominant feature of the left hemisphere is linearity and sequentiality, there are good reasons for calling it the 'visual' (quantitative) side of the brain; and because the dominant features of the right hemisphere are the simultaneous, holistic and synthetic, there are good reasons for indicating it as the 'acoustic' (qualitative) side of the brain."

The new electronic, simultaneous environment pushes the right hemisphere into dominance after 2,500 years of left hemisphere dominance, i.e., since the phonetic alphabet (McLuhan, 1976). Perhaps with the development of electronic communication, our awareness of the latent activities of the right brain will eventually equalize the right with the left.

The electronic age has taught us many of the limitations of the print-oriented, goal-structured, linear, wordy, and logical-thought society. The electronic age has also revealed to us the range and depth of human potential and the capacity of human resources to alter and change conditions which are true to one's nature. This would mean, that in view of understanding some of the information process activities of the brain, community development workers must bring about in any environment of social change, information which "appeals" to both left and right brain. The need for integrating and presenting information in a variety of ways is essential in order to truly develop human potential. In view of two-way information, again those elements of information exchange must contain the two cognitive styles of learning. As we have seen in Chapter III, the Telidon tends to have greater capabilities in the interactive process of providing "facts" to citizens. However, with additional development, graphics etc., it will assist in providing information reflecting more of the right hemisphere. With the HI-OVIS more information is available -- audio and visual are included, and this allows for more interaction between citizens. More information is made available because of the increased sophistication in the technology, meaning that more participation is encouraged involving both sides of the brain.

C. Holism and System Theory

Scientific insights into the brain studied through holographic modeling have revealed that brain function is potentially distributed throughout each cell of the brain (Eccles, 1973). Now it is overwhelmingly clear that wholes cannot be understood by analysis. Unlike Westerners, the Chinese have never thought in terms of substance, but rather in terms of relationships. Philosophers such as Whitehead (1925), Needleman (1965), Bertalanffy (1956) and Smuts (1926) have made it clear in their writings that western science has always tried to understand nature by breaking things into their parts. Jan Christian Smuts (1926, 285) also takes the view that the very act of separating the conscious from the unconscious falsified for instance the nature of personality. He viewed the universe, the world, as being essentially unitary and by breaking it down, an inherently untrue picture of events occurs.

Analysis falsifies the essential inner integrative process. Half a century ago in Holism and Evolution, Jan Smuts (1926) tried to synthesize Darwin's evolutionary theory and Einstein's physics to account for the evolution of mind as well as matter. In Smuts' view, wholeness is a fundamental characteristic of the universe -- the product of nature's drive to synthesize. In the process of synthesis, things come together, something new happens. This view is shared by both Teilhard de Chardin (1961) and Julian Huxley (1959) who saw all change as a continual process of transformation and a thrust toward ever-higher orders of complexity and integration. As simple atoms unify to become molecules and as simple social unities unify to become societies, each synthesis becomes an expression of more complex interconnections. They become new wholes which in effect are dynamic and evolutionary; all living and non-living systems become more complex. Since a complex structure is connected at many points and in many ways, the more complex a structure, the more energy and information is needed to maintain all those connections. Smuts and Teilhard held the view that all living and non-living systems are open systems in that there is a continual process of evolution or Genesis occurring in unpredicable directions. In the process of change and transformation, more connections are made. In social terms, this means new patterns create new stresses and new opportunities. With greater complexity and greater instability and mobility of society, more interactions occur. This means greater potential for new connections, new organization, diversification and variety. Systems and structures become more pluralistic and diversified.

General System Theory, a related modern concept, maintains. that each variable in any system interacts with another variable so thoroughly that cause and effect cannot be separated. One cannot understand the activity of an organism (cell, brain, family, or culture) if it is isolated from its context. Ludwig von Bertalanffy said that General System Theory explains systems, organizations and communication holistically in this way:

> "Modern science is characterized by its ever-increasing specialization, necessitated by the enormous amount of data, the complexity of techniques and breakdown of science as an integrated realm. The physicist, the biologist are in a private universe, and it is difficult to get a word from one cocoon to the other. There is, however, another remarkable aspect. If we survey the evolution of modern science, as compared to science a few decades ago, we are impressed by the fact that similar general viewpoints and conceptions have appeared in very diverse fields. Problems of

> organizations, or wholeness, of dynamic interaction, are urgent in modern physics, chemistry, physical chemistry and technology. The same trend is manifest in gestalt theory and other movements as opposed to classical psychology, as well as in modern conceptions of the social sciences. These parallel developments in the various fields are ever more dramatic if we consider the fact that they are mutually independant and largely unaware of each other." (1956, 39)

General System Theory is broad in scope in that it also aims towards cross-disciplinary unification. Its application ranges from biophysics and genetics to the dynamics of space probe; from the problems of molecular biology to those of psychiatry; and from the problems of economic political units to those of the processing, manufacturing and utilization of high technology.

General System Theory is symptomatic of a change in our wide vision. We now see the world and events as a great dynamic interactive organization in evolution.

D. Consciousness

Until recently, Western psychology has ignored the study of consciousness. Consciousness was not considered to be a suitable subject for the tools and philosphy of Western science which was designed to observe and measure objective material phenomena. In various Eastern psychologies a very different situation has prevailed; consciousness has been viewed as a central and primary constituent of reality. Clarifying and understanding one's consciousness has been regarded as the highest human goal and path to psychological health and enlightenment. The current view is to synthesize this Eastern knowledge of consciousness with Western psychological concepts and empiricisms.

With the advent of the psychedelics (Grof, 1975) and more recently the use of consciousness-modifying technologies such as meditation, yoga, and biofeedback, researchers have begun empirical investigation of altered-state phenomena. It appears that the range of states of consciousness is considerably broader than previously recognized, extending from psychopathology through our usual waking state to "higher state" (White, 1973, 38; Wilber, 1975, 38).

Various functions and abilities have been noted to be state-dependent, i.e., limited by the state in which they occur. For example, in state-dependent learning, what is learned in one state may not necessarily be remembered or comprehended in another. Similarily, with state-dependent communication, the insights of an individual in a particular state may not be comprehensible to another in a different state. Ken Wilber points out that there exist states of consciousness, superior to our usual ones, that allow profound insight into the nature of reality and consciousness. He suggests that states of consciousiness are ranged along a spectrum, representing different levels of expression of consciousness. Each level has associated with it a unique sense of experience and identity, ranging from the experience known as Supreme Identity, Buddhahood, Christ Consciousness, Cosmic Consciousness, all the way down to body consciousness. Various psychologies, he suggests, "have addressed different levels of this spectrum and hence should be seen as complementary rather than oppositional." (1980, 79)

The spectrum of consciousness revealed across the centuries has found surprisingly close agreement in recent studies of psychedelics. Stanislov Grof (1975) who has done clinical research experience with psychedelics, has found and recognized the presence of a different set of experiences and state of consciousness. In Realms of the Human Unconscious, he reports that his research uncovered deeper and deeper layers of the unconscious. This begins with traditional psychodynamic phenomena, progresses through Rankian-birth-trauma and Jungian symbology and finally to a variety of transcendental experiences (1975, 98). These states and accompanying experiences not only closely resemble those described by advanced practitioners of the consciousness disciplines but allow significant insight and understanding of these traditions.

The work of Stanislov Grof points to the idea that the human unconscious is not undifferentiated and homogeneous but rather is conprised of different levels and structures. In A Development Model of Consciousness, Ken Wilber (1974) examines the development of these levels and structures of the unconscious. What is unique is that he follows this development sequence through the unfolding of the successive structures of the unconscious which parallel the states of consciousness in non-Western disciplines.

Another way of conceptualizing consciousness and altered state is employed by Charles Tart (1975). He points out that a state of consciousness is a highly complex system constructed of components such as attention/awareness and identity. He proposed a systems approach for altering consciousness, disrupting pre-existing patterns by modifying one or more components. This systems approach provides a bridge that allows certain aspects of non-Western knowledge to be reconceptualized within a Western framework.

Philosopher Jan Smuts also perceives nature as wholes (1926) with hierarchical levels: each whole is a part of a larger whole which is itself a part of a larger whole. Because the human mind or psyche is an aspect of the cosmos, we would expect to find in the psyche the same hierarchical arrangement of wholes within wholes. In general, such is exactly the discovery of modern psychology. As a general conclusion, then, we may say that the psyche, like the cosmos at large, is many layered (pluridimensional) and composed of successively higher-order wholes (Loevinger, 1976).

In modern development psychology, the whole of any level becomes merely a part of the whole of the next level. This science devotes itself to the explanation of the various levels, stages and strata of the human condition - mind, personality, psychosomatics, character consciousness. The cognitive studies of Piaget, Werner and the works of Loevinger (1976), Arieti (1967), and Maslow (1968), all subscribe in whole or part to the concept of stratified stages of increasing complexity, integration and unity.

Those who have looked at the stages of development have suggested that the world's greatest mystics and sages (e.g., Buddha, Lao Tse, Socrates, Aurobindo) represent the highest stages of human development. If we take these higher stages and then consider the lower and middle stages/levels which have been studied by Western psychology, we would arrive at a fairly well-balanced model of the spectrum of consciousness.

The Lower Realms

Eastern and Western psychology alike agree that the lowest level of development involves simple biological functions (somatic processes, instincts, sensations, perceptions, and emotional-sexual impulses). All this points to one of Freud's ideas that the body ego or body self tends to develop in the following way:

> At birth, an infant cannot distinguish self from not-self, subject from object, body from environment. The self at the earliest stages is one with the physical world. That stage of material oneness . . . expresses Atman-consciousness. (Freud, 1950, 100)

Out of the material oneness, a separate self emerges and as Freud said, the self emerges foremost as a body self. The infant gradually learns to differentiate himself from the material cosmos at large. The body ego transcends the material environment. Through the process of differentiating the self from an object, the self transcends. At this body ego stage(s) then, the ego no longer is bound to the environment, but is identified with the biological body. The self as body ego is dominated by instinctual urge, impulsiveness, the pleasure principle, drives.

Eventually, however the mental or conceptual functions begin to emerge out of and become differentiated from the body ego. As language develops, the child is exposed into the world of symbols, ideas, and concepts and thus it gradually raises above the instinctual and impulsive body ego. As the mental-self emerges and differentiates from the body, it transcends the body and this operates upon it using its own mental structure as tools.

During adolescence, another extraordinary differentiation begins to occur. The self simply starts to differentiate from the representational thought process (Tart, 1976). The overall point seems fairly clear: consciousness, or the self, is starting to transcend the verbal ego-mind. Self is starting to go trans-verbal.

Now a consciousness begins to transcend the verbal-ego mind; it can integrate the ego mind with all the lower levels. Because consciousness is no longer identified with any of these elements to the exclusion of any others, all of them can be integrated; the body and verbal ego can be brought into a higher-order holistic integration. This stage is referred to as the "integration of all lower levels" (Sullivan, Grant and Grant, 1957, 378); integrated (Leovinger, 1976, 176); self-actualized (Maslow, 1968); autononomus (Fromm, 1941; Reisman, 1954).

Intermediate Realms

The ego mind is the higher level of consciousness studied by Western psychology. Western psychiatrists and psychologists either deny or repress the existence of any sort of higher-order unity, pathologize its existence, or explain it as abnormal behaviour. As to the nature of higher levels of consciousness, beyond body ego and mind ego, the mystic-sages shared by Eastern and Western tradition have made contribution to the understanding of the human condition which Western thought has not properly understood. What is significant from these divergent schools of thought is that they agree unanimously as to the nature of the "furthest reaches of human nature", (Bruteau, 1974, 282; Bronowski, 1978, 180).

Consciousness at this stage of development goes trans-verbal. By further differentiating itself from the mind and body, it is able in some way to transcend the body-mind and therefore operate upon the world and the organism in ways that appear to be quite fantastic and farfetched. This is, on the whole, the realm of high religious intuition and inspiration.

Aspects of this emerging self have been called the "over-self" or "supra-mind", Auribindo (1950) and "Omega", Teilhard (1961). In this system it is the link between Absolute Being, Consciousness and Bliss and the present world of matter, life and mind. As it were, the self takes on a "vertical" jump and transcends itself in a manner which attains collective consciousness and there is a realization that somehow we and our neighbors together constitute a greater "ourself". Behind geopolitical, linguistic, attitudinal, religious, and social differences, a "cosmic sense" emerges. Simultaneously, there is a horizontal link with other people in new ways. With an increased sense of self-transcendence, one is capable of identifying with more and more people and of bypassing specific ego-development appropriated to a particular prison, or a particular culture or even life style.

The Ultimate Realm

As the process of transcendence and integration continues, it discloses even higher-order levels. At this point, the self dissolves into deity of one's own self or a higher archetype having no boundaries. This total and extreme transcendence into Formless Consciousness is Boundless Being. There is here no self, no god, no object, no subject, and nothingness. In the here and now, the whole is present. Past, present and future exist simultaneously (Zukov, 1979, 295). One becomes conscious of the cosmic connection. Consciousness as such is the development of a conscious self differentiating from but into the material world, and consciously penetrating and operating at all levels reaching new levels of self-understanding, freedom, and identification with all what is. The "other" is no longer to be feared, but to be loved.

Development Process

Overall, the process of psychological development operates in stages or levels. At each stage, a higher-order structure -- more complex and therefore more unified -- emerges through a differentiation of the preceding lower level. The self identifies with that emergent structure. If the Wired City creates a new social order, it becomes a new structure for the collective identity to be part of. In the process it must become part of a "higher-order structure" while at the same time differentiate from the industrial-age culture. The point is that because the self is differentiated from the lower structure, it transcends it and thus can operate on that lower structure by using the tools of the newly emergent one.

It is important to note that at each successively higher order, structure is more complex, more organized and more unified. Evolution continues until there is only unity. If the electronic age is to be the hidden secret towards a global community, the telecommunication system becomes truly a tool for social development. Telecommunication becomes a transformer of human energy in that it actually directs "self-realization" through self-transcendence in a significantly creative symbolic world.

New Research Directions

A basic assumption of consciousness study is that there is more than one's personality involved. Personality is a sense of a separate, different, unique identity; it is one facet of the self, of the total identity. To be totally identified with one's personality may be evidence of psychopathology (Laing, 1976). In therapeutic and learning environments, an individual is allowed to disidentify from the restriction of the personality or cultural values and to apprehend his identity with a total self (Assogioli, 1975). In effect, this means that he must perceive that distinction between identity and personality or body ego or mind ego. To the extent people identify with a neurosis, eg. a facial tic, inadequate sexual performance, fears of dying, lack of meaning, phobias, they do not see "change" as exchange but rather as loss. Identity in a sense has been fossilized in a particular area of body or mind ego and social ego and needs to be liberated.

The study of consciousness reveals the holistic nature of self. This has been brought together with insights of the individualistic psychologies of the West and the spiritual psychologies of the East and Middle East (Aurobindo, 1950, 181). In light of the "global village" mind, it means to differentiate our identity from current social, political, economic status quo and develop to a higher level of structure and unity while preserving previous levels. Due to the rapid social and global changes, roles, tasks, and traditional social patterns are due to change. For survival purposes one's identity must be differentiated in such a way that it identifies with the universal self. In doing so, the post-industrial man is likely to be simultaneously at a world series, running a corporation, enjoying a plate of oysters, defending human minority rights, rebuilding an old car, meditating, even watching a blue movie on pay T.V., or participating in an information dialogue on a home computer, the electronic connections of which are with people in South America, Europe, and Africa.

The goal of the self, unbound by any specific body, mind or social ego, is to transcend the social network and enjoy the world but not be attached to it to be of service, but not become fixed in a particular pattern.

Consciousness studies broaden the view of answering the basic questions of:

Who I am?

Why am I here?

Where am I going?

But they also help in expanding identity from the person to the ego or the body (mind) to the collective social world to the cosmos. We could just as well speak of a progressive dis-identification or a progressive detachment from all exclusive identifications.

The overriding concern of the Eastern explorers of consciousness has always been with the recognition of the mind having different levels and has give little attention to pathologies that could develop on specific levels. On the other hand, the West's focus on the study of psychopathology began to develop in a metaphysical vacuum; a world view or ecological context had not been established. Taken together, they form a complementary approach to consciousness that spans the entire spectrum.

Conclusion

The universe is seen by modern scientists as a dynamic web of interrelated events. None of the properties of any part of this web is fundamental; each follows from the properties of the others. This unity and interrelationship of all phenomena is very much in the spirit of Eastern mysticism, the essence of which is that everything in the universe is connected to everything else.

Science and mysticism are two manifestations of the human mind, of its rational and intuitive faculties. Although their approaches are different, they are nevertheless complementary and supplementary to one another in providing for a fuller understanding of the world. Man must know both in order to know himself; mystical experience is necessary to intuitively understand the deepest nature of things and science is necessary to explain how events occur. What we need in our wider vision is to understand this interplay between mystical intuition and scientific analysis.

Science and mysticism both reveal the unity of all things. Brain studies have indicated the importance of feedback information processes which occur in both the left and right hemispheres. The left codes information in the digital fashion; it analyzes, differentiates and perceives sequences. The right hemisphere essentially processes non-verbal information. These views parallel the way information is processed in physics and telecommunications.

In his influential book, Understanding Media, Marshall McLuhan (1964) described the coming world as a global village, unified by communications technology and rapid dissemination of information. Developing a feedback of information is essential for any system, applied now in the communication industry in the Telidon and the HI-OVIS in Japan. This electrified world with its instant linkage bears some resemblance to that of instant communication in nature (superluminal phenomena), and to the unitive experience expressed by mystics.

The brain handles non-verbal information through symbolizing. As discussed in Chapter II, brain research further affirms man's uniqueness in the manner information is processed. It indicates that information systems, to be truly helpful in human development, must include other sytems which allow the participation of both hemispheres of the brain. Though the Telidon provides a variety of information, it is essentially for the left brain. Certainly with the technical development of graphics, some balance can be maintained by providing some information for the right brain. Brain studies have, in essence, indicated some new facts, and our task is to design communicaton systems respecting this scientific evidence.

A newly recognized, century-old frontier is opening to us, which our technological experts, social planners or even policy makers generally speak little of. The realm of the human psyche and its corresponding areas of mysticism, left and right brain, consciousness and system theory, already prove the width and breadth of human potential to be far more vast than had been imagined. This points to the possibility of a broad, integrated synthesis and new guiding paradigms concerning who and what we are, the fundamental nature of the universe and our relationship to it.

New models and perspectives offer new opportunities. Expanded ranges of collective human experiences afford a new vision of what we can be. The recognition that we are active co-creators shifts our self-perceptions from passive victims of various pathologies to active designers of our physical, social, political, and economic world.

Every person operates out of a mental framework of assumptions and images about the world. For most of us, most of the time, this world view is not articulated. Since the mental model, that affirms the concept of networks, connections and interdependence, differs in some fundamental way from the established world view, this chapter has set up some theoretical underpinning to the further development of telecommunications in the Western World as well as the Third World. Just as models affect the way we see things, they also affect the way we utilize technology for the purpose of applying the principles of community development in a telecommunications two-way system environment. New visions of what the role of telecommunications can be alter the very direction of our policies and the utility in which it can be applied. Intellectual support for an emergent vision of community building offers us new directions and new hopes.

Aurelio Peccei, founder of the Club of Rome, has said "vision is the yeast of change". Information broadens our perceptions and our understanding: new information broadens our visions. Technology must be designed such that information and communication can occur with ease and availability. Community development workers must implement those tools in order to bring into reality a new social order.

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CHAPTER VII

ROLE OF COMMUNITY DEVELOPMENT

Process

Masuda (1981) describes information space as a field in which people are connected with a network of information. It is an information matrix where a variety of network and social relationships are dynamically connected. Through the use of computers and telecommunications, human interests, concerns, and experiences are being made known to others, maintained and updated. This continuous flow and feedback of information to and from people features the beginning of an "information society", whereby the community is seen as a social network constantly changing in its goals, roles, and structure. The telecommunication system is therefore the infrastructure to the non-geographic community. Through a network system, information is not confined to any particular geographic structure or even cultural group; it is invisible human meaning shared across geopolitical boundaries, making it available and accessible to more citizens.

One experiment that is actively providing people with services in their everyday lives is the Office for Open Network in Denver. This office is a communication medium through which people can find others whose services or interests may match or complement their own. According to the designer, Leif Smith:

> "Everyone has his/her own personal networks -- business, family, social, etc. Personal networks, however, have their limitations. Suppose you are an attorney with an interest in Russian icons or in designing a City of the Future. Where do you

> go? The odds are against your finding someone in your personal networks with such interests. The best way to extend your personal networks is to use the process called the open network to put you in touch with others conducting similar explorations, thereby enabling you to collaborate to mutual advantage as you so wish." (Lipnock J. et.al., 1982, 140)

Since its inception in 1975, the Office for Open Network has grown to include some 850 scientists, artists, mathematicians, crafts people, writers, entrepreneurs, politicians, investors, bankers, theologians, educators, engineers, architects, consultants, city planners, philosophers, poets, and investors. Unlike traditional organizations, the Office for Open Network has no social, political, religious, or educational entry requirements.

The above example is a glimpse of what characterizes an information society. The emergence in the past five years of an inexpensive, decentralized computer capability offers community development workers one of the most powerful tools ever to become available for community building. Harold Kaufman (1966) argues for an interactional approach to the concept of community in the post-industrial world. Change and development call for a theory focussing on dynamics and process.

The second rationale is expressed by Jessie Bernard:

> "For the most part, the sociologists have been interested in the community structures which result from interaction rather than the interaction processes themselves. It would seem that the time may be ripe for a greater emphasis on dynamics interaction in community studies and also, perhaps, for greater recognition of the community aspects of all interaction studies." (1966, 90-91)

The thought expressed here is that sociologists have a contribution to make to the study of community if they see it as a dynamic rather than static social entity. This is reinforced by Irwin Sanders (1958) in his discussion of community development as a process and a method. The former is seen as focusing on sequences of interaction, while the latter is seen as a means toward an end. He says:

> "Some social scientists think of community development as a process and focus upon the sequences through which communities go as they move from a pre-industrial to an industrial or similar kind of overall change; others who are action rather than research-oriented think of community development as a method to be used in moving toward their objectives. They do not lose sight of the fact that processes are involved, but they focus on accomplishments rather than upon sequences." (1958, 4)

If community development is seen as a process, then the focus is upon theories of social change. Sanders said of social change:

> "If change is to be considered social it must focus on the changes which occur in the bonds between people, in the social group, and in the community viewed as an area of interaction." (1958, 146)

Looking upon change as an adjustive process, he saw social interaction as involving change in certain units adjusting to change in other units. As one segment of a community undergoes change, adaptive or adjustive modifications are to be expected in others. This will recall the concept of systems theory, to which reference has been made.

That there has been research on community dynamics is documented by Kaufman when he indentifies the interactional study of community:

> "The notion of the interactional field or arena present here is a highly tentative one. It is much

> more an enumeration of elements of an interactional conception of community rather than a precise statement of their interrelationship. . . Although the concept is highly general, heuristic, and primarily of value in organizing concepts with more restricted reference, it is also amenable to graphic presentation and analogy. The interactional field probably has several dimensions, the limits and interrelation of which need to be determined. The community field is not a Mother Hubbard which contains a number of other fields, but rather is to be seen as only one of several interactional units in a local society." (1966, 91-92)

Kaufman further articulates this notion by saying:

> "The community field consists of an organization of actions carried by persons working through various associations or groups. This organization of action occupies the centre of the community arena and is distinguished from other fields of action in a locality by complex characteristics or dimensions. Providing a setting for community action and an integral part of the arena are patterns of demographic, ecological and physical factors." (1966, 92)

The focus of study in the interactional model is upon community actions and interactions as they constitute the dynamics and processes of the community field. For Masuda (1981), information is the ingredient that is involved in community action and interaction. The two-flow in information is the centre upon which community is created.

Elements of the Interaction Model

- Action and Interaction

The term action may be more appropriately used when seen in a time sequence; the concept of interaction is used when the relationship amongst persons is the major focus. Usually in operational terms, actions are referred to as projects, programs, activities, or events. Three important elements of any action are:

a. the persons involved (actors, participants),

b. concept of field, the space, with concrete content, within which the persons are involved in an action with conscious purpose or it may be the field of information space which is non-geographic. Information space has no boundaries, but the objectives are related to each other through information networks,

c. the stages and phases of action through time.

The degree of participation runs all the way from assuming a major role in policy-making to no more than identification with the locality resulting from residence or sustenance activities. Only a minority of the population is ever active at a given time; of this group some will be the leaders, power "elite" and/or "persons of influence". This is elaborated when Kaufman says:

> "The kinds of questions which are central considerations in the interactional approach are: who makes decisions and influences community action? on what phase of the project do given persons appear? is there a division of labour or do certain persons appear in every project?" (1966, 94)

Community in the modern world is seldom if ever expressed through only one association. In fact, a great variety of groups may at one time or another be involved in community action. Kaufman suggests five phases or reasons why communities take action. These are:

> "(1) Rise of interest. This implies an awareness of need and perhaps a general solution and the spreading of the consciousness; (2) The organization and maintenance of sponsorship. A

> major sponsor, a group or individual, can always be identified and frequently there is one or more auxiliary sponsors; (3) Goal-setting and the determination of a specific means for their realization. This is the decision and policy-making phase; (4) Gaining and maintaining participation, especially of the rank and file. This is the public relations and recruitment phase; and (5) Carrying out the activities which represent goal achievement. Action may be occasional, periodic or continuous. In many cases, this sequence will repeat itself beginning with phase two; conversely, the sequence may not be lived out to completion. 'What action and associations are included in each phase is a way in which three elements of action -- persons, field, and process -- may be interrelated.'" (1966, 96)

- Distinctiveness of the Community Field

Kaufman writes:

> "Six types of characteristics, dimensions, or criteria are suggested for differentiating community action from that not appropriate to the community field . . . . The dimensions noted are (1) the degree of comprehensiveness of interests pursued and needs met, (2) the degree to which the action is identified with the locality, (3) the relative number, status and degree of involvement of local residents, (4) the relative number of significance of local associations involved, (5) the degree to which the action maintains or changes the local society, and (6) the extent of organization of the action." (1966, 97)

- Range of Interests

With regards to the first characteristic, Kaufman has said that it is essential that an action be identified with the locality and that it either express a number of interests in the local life or be closely related to other actions which express such interests.

> "If actions cover a wide range of interests at the local level, they will of necessity involve a number of significant participants and groups.

> An example of an activity which would rank very high at the centre of the community field would be a well-organized and productive community development program. An example of an action in a locality which has no local reference whatsoever would be a national convention with no local participants . . . . By definition, the ends of the community development program are entirely oriented towards improving and increasing identification with the locality. The program pursues a variety of interests, from economic development through the pursuit of religious goals. In this activity, many significant community members and groups must be involved." (1966, 98)

- Identification with Locality

Turning to the second characteristic, Kaufman argues that localities vary greatly as to the number of interests which are expressed through locally-oriented activities and that these variations are co-ordinated. In some cases, locality has lost many of its locally-oriented activities and thus has declined as an interactional unit.

In the study of any given locality, the student of community interaction is interested in discovering whether the area is merely a "chunk of mass society" or whether it has a number of interrelated locally-oriented associations which are carrying out the common life. Kaufman says that:

> "Most so-called community context studies have been in the community but not of it. That is, they have used a locality as a basis of sampling but there has been no identification of the phenomena under study with the interactional community. Persons, fields, and processes must be interrelated." (1966, 99)

- Degree of Involvement

The number and significance of individuals and associations participating are debatable criteria in community field definition. If the position is taken that for action to be highly community in character there must be a high level of participation on the part of both individuals and associations, then a bias is introduced favouring what is termed below the "participating community" and this of necessity limits the size of population. If high participation is a dominant value, then the community would be smaller by way of membership than it would be if only a little participation was required in order for individuals to be considered as part of the community.

- Change and Stability

With regard to change and stability, Kaufman notes:

> "In the present world with many forces destroying locality group identity, much community action is oriented to creating community. This makes of central importance in an interactional notion of community, those values, complexes, and cultural themes which people want to realize in their localities. Community in the present-day world is always more a dream, an ideal, than a reality." (1966, 100)

Interactional Perspective in Research

However, as it stands now, the interactional approach makes three contributions to the study of community. First, the emphasis is on dynamic interaction, through which forms association and institutions change. A second contribution is the scope and inductive nature of the perspective. Third are the institutional, demographic and ecological considerations.

The concept of field in community development refers to a point of centering where various views converge with a particular ethos determining roles, activities and players. If the orientation is democratic, many people are engaged. On the other hand, in a situation where the population is relatively large, only a small proportion can occupy the stage at one time. The community field consists of an organization of actions carried on by persons working through various associations or groups. This organization occupies the centre of the community arena and is distinguished from other fields of action in a locality.

The field approach to community can best be described in operational terms as "information axis" or "synergistic co-operation". Synergy means that each person cooperates and acts from his standpoint in solving common problems with a readiness to voluntarily sacrifice his own interests for the common good. Whereas synergism goes beyond cooperative effort, synergistic cooperation combines action of a particular focus with other centres of action, thus the creation of the total effect of things acting together is greater than the sum of individual action of particular units separately. A network of information is established and continues to expand. This leads us then, to view the interactional model of community as consistent with the concept of the open system and the non-geographic community discussed earlier in the thesis. In view of the emergence of "information society", the computer-communication technology is a new basis for information transmission, which further expands the interactional model of Kaufman. Space and locality are connected by information networks. Depending on the development of the networks, Masuda (1981) suggests that information space may be a) limited space (locality), b) regional-national space (sharing of information regionally), c) global space information. This would suggest that the interactional conception of community is a dynamic one in which information is created synergetically. The community is linked through a varied of pluralistic social units and more units are created; new associations and institutions come into being; learning becomes innovational (Botkin, 1979).

The relevance of the non-geographic concept of community, as previously discussed in the thesis, underlies Kaufman's conceptual relevance of the interactional model with the views showed by Masuda on information. Out and in "interaction" information is transmitted. Networks transmit information to the units and in the process, information becomes accumulative, and synergetic in its effect.

Kaufman concludes by saying:

> "The social value of community research may be measured by the extent to which it contributes to realizing the types of community that people desire. In this endeavour, the sociologist has a continuing challenge to work with action leaders in developing and making explicit various alternatives designed for the good community and suggesting conditions under which these goals may be realized. (1966, 100)

Conclusion

Interest in community change and development calls for a theory focussing on dynamics and process. Kaufman's notion of the interactional field is a descriptive one that is more an enumeration of elements of an interactional conception of community than a precise statement of their interrelationship. One may visualize the community field as a convergence of energy and information reflecting a particular ethos of the society determining the players and plays. The community field is an organization of action-energy, information-interaction, carried on by persons working through various associations or groups whose function is problem-solving for the community. However, through the process of action and interaction, social networks and links are established, thus extending social action and change to other action and network groups. Kaufman has identified five stages or phases of community action; those arising because of (1) rise of interest, (2) organizational and maintenance of sponsorship, (3) goal setting and the determination of specific means for their realization, (4) gaining and maintaining participation, and (5) carrying out the activities which represent goal achievement.

In social action, there is a centering; people respond and act upon an information set. This information set further creates other action by intensifying or broadening the goals to a wider spectrum of social units. The "information axis" creates a synergetic effect thus making the community take new forms and structure. It redefines itself.

The analysis of an action process is a continual one. But in view of its dynamic perspective, community development takes a new shape in the twentieth century which is different from the dynamism and structure of the agricultural or industrial society.

With the development of the human potential movement and consciousness studies, subjective values are emerging to broaden man's potential for development and greater recognize his resources.

This broadening gives indepth recognition of new information which makes it possible for more people to create new links with others having a need for sharing, trusting, creating, and participating.

The communications revolution in the era of the information society provides new avenues in which patterns of communication system can and may develop. The Telidon, HI-OVIS, and the Office for Open Network are indicators of how social networks may be linked through a computer-communications infrastructure in order to link and facilitate a synergistic process of information exchange between citizens. When the boundaries of human needs expand, the development of the means to satisfy them creates new needs. Up to the Industrial Age, the satisfaction of human needs has been achieved mainly through the production and consumption of material things. But in the information society, a wholly different societal principle makes its appearance. Some of the following characteristics are:

(1) Human needs will be oriented toward pursuit of a self-determined goal.

(2) The basis of satisfaction of human needs will be information-productive power.

(3) Human needs will be satisfied through the process of production of information and goal-oriented action.

This change-over from material values to human values results, in part, from the shortfall in natural resources, increased pollution and environmental disruption, as well as the remarkable expansion of knowledge-creating information capacity (Telidon, HI-OVIS, and the Office for Open Network).

The development, therefore, of the process of production from consumption of material goods to information to satisfy human needs may be conceived of as a qualitative development. This interactive process creates a community field which involves a matrix of social involvement and participation. The result is a change in community development structure from local space to functional information space connected by information networks.

FOOTNOTES

Bernard, Jessie (1966). "Towards an Interactional Concept of Community"; Perspective on the American Community. Roland L. Warren, ed., Chicago: Rand McNally and Company.

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CHAPTER VIII

CONCLUSION

In this thesis, two-way television has been explored as a tool for community development. The results indicate that the capabilities of these systems is largely unknown to the general public. The two case studies (Telidon in Canada and the HI-OVIS in Japan) have shown that the use of the two-way (feedback) incorporated into the hardware design had significant positive results in the process of community building. Nevertheless, the results do not imply that the present form of mass broadcasting will disappear. The centralizing function of television will continue but its dominance of an individual user's time may be diminished as a result of the introduction of telecommunication services.

The diversity and the growing complexity of communities is one of the phenomena of the information society. Because of these social trends, the need for a variety of information systems will always be in great demand. In the context of a pluralistic society, a mix of alternative media is necessary to meet a variety of needs of many people at the same time.

With the Telidon, the beginning of two-way TV communications is taking shape. Information is playing a prominent role in Western society and the implosive attitudes and values of the population has manifested a need for more relevant information. This progression is irreversible, so choices must be made in order to plan how information needs will be provided to citizens. Information is the very basis by which citizens bring about changes in their structural and functional relationships with each other and with other communities surrounding them. As discussed in Chapter Four, an integrated approach to communication allowing accessibility and a feedback mechanism is necessary for any ongoing evaluation, correction, and self-correction of community growth and development. The underlying assumption of this process is that communications should sense the needs of the people and of their communities. This very process of information exchange also provides a context in which human meaning emerges from information exchange through symbols, myths and language. The social interaction concept emphasizes that in the process of information exchange communities are built, strengthened, and helped to grow. The study of Japan's HI-OVIS using the interaction mode of visual and audio communication confirmed this.

In view of the trends towards the information society, telecommunications technology will further assist the activity of social exchange where the unknown sources of information and the people that supply it will be known by what Cooley refers to as the "secondary group". In these groups there is less intimacy, more formality and less continuous face-to-face association. With the HI-OVIS experiment, the face-to-face association was possible, but it tended to be for special purposes rather than involving the participation of the "whole" personality. The secondary group is more casual; and individuals participate with only that segment of their personality that represents the shared interest.

In view of changing structural and functional patterns of communities, an analysis of the system approach to communities provides us with a set of useful conceptual tools. With the increased variety of group interests, the concepts of vertical and horizontal patterning show how communities are developing into multi-functional relationships. In Warren's terms, a community is described as a social system having two distinct types of systemic ties: the vertical pattern, or the relationships through which they are oriented to the larger society beyond the community, and the horizontal pattern, or those that local units share with each other on the local level. (1979, 240)

In Warren's view, the vertical ties are stronger because they tend to be planned, and bureaucratically structured. Thus the information society brings with it a situation in which increasingly differentiated community units are coming to be related more integrally to the larger social systems which set up quite different norms, behaviour patterns, and role expectations than those involved in the interrelationship of these diverse units on the local level. Under these circumstances, two-way telecommunications will have a useful function in unifying non-geographic citizens, a situation which is historically unprecedented.

Telecommunications systems, in continuing to create a complex web of connections, can provide social interaction through the two-way media networks. A community field is created whereby individuals, citizens and associations have different levels of participation or degrees of involvement. This concept of "community field" or "interactional" notion as described by Kaufman (1966) represents a dimension of community that transcends time and space. As we have discussed in Chapter VI, new levels of awareness and information expand and add new dimensions of meaning to motivation and social change. Those qualities and characteristics of human symbolism again support the idea that man reflects qualities of his being which transcend his own time and space (culture) and that in the community development sense, those qualities are shaped in a context of a "community field".

From the old approach to TV as a product, the new emphasis must become one of process in the community. The development worker must of necessity inform the citizens of this medium, and the policy makers who advise government and private administrators should include a technology, a software designed for social purposes, as a need for policy change. Every agency currently having problems with information overload or expressing a lack of citizen interest must be alerted of new possibilities for developing new information channels which can be of benefit to both the organization and the population it serves.

Researchers, scientists and those few specialists who are aware of the capabilities of telecommunication have indicated that an extremely large gap exists between the current distributors of the information and the communities they serve. Some means must be provided to bridge this gap in order to bring community and these new facilities together. In this researcher's opinion, the hardware development is far advanced. There is a tremendous need for people, who understand the interaction of our system of communication with other institutions in our society, to work with cable operators, community groups and policy designers at the provincial and federal level in order to bridge this gap. History has indicated that a few specialists are not very successful in identifying community needs at a time of depleting resources, population growth and global food shortages. A system to allow citizens to have input is another alternative, but it is an approach that requires radical changes in thinking and in behaviour. Programs and projects with a community development component must be included if human energies are to be best used. Human resources must be channelled into new dimensions which facilitate better communication and better information flow, in order to function as a counter-entropic force in the community.

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APPENDICES

TELIDON TRIALS

ESTIMATED START	LOCATION	NUMBER OF USER TERMINALS	TRANSMISSION	TRIAL OPERATOR CONTACT
November 1981	Vancouver, B.C.	150	Telephone Circuit	Ron Payne, Electronic Messaging Services Development Project Manager, British Columbia Telephones, 17th Floor, 3777 Kingsway, Burnaby, B.C. Tel. (604) 432-3053
August 1981	Calgary, Alberta	60	Telephone Circuit; Switched Network	J.D. McDonald, Project AGT/Telidon, Alberta Government Telephones, Floor 30-F, 10020 - 100 Street, Edmonton, Alberta T5J 0N5, Tel. (403) 425-4336
1981	Regina & Saskatoon Saskatchewan	TBA	Telephone Circuit initially-coaxial cable later	Ian McCallum, Cablecom Corporation, Executive Director, 8, 1540 Alberta Avenue North, Saskatoon, Saskatchewan, S7K 1R6. Tel. (306) 665-2988
September 1981	Elie, St-Eustache, Manitoba	150	Optical Fibre	George Tough, ELIE Project, Manitoba Telephone System Area B-301, P.O. Box 6666, Winnipeg, Manitoba, R3C 3V6 Tel. (204) 947-7387
Started June 1980	South Headingley Manitoba	33	Telephone Circuit	Dennis McCaffrey, Project IDA, Manitoba Telephone System B-102D, P.O. Box 6666, Winnipeg, Manitoba R3C 3V6. Tel. (204) 947-8418
a) Started Jan. 1980 b) March 1979	Throughout Ontario	55	a) Broadcast b) Telephone circuit	Maria Cioni, TVO Telidon & Education Trial, Ontario Education Communications Authority, P.O. Box 200, Station "Q", Toronto, Ontario, M4T 2T1. Tel. (416) 484-2930
May 1981	Toronto, Montreal Quebec City	491	Telephone circuit	Paul Perry, Project Vista, Bell Canada, 5th Floor, 25 Eddy Street, Hull, Quebec, J8Y 6N4 Tel. (819) 776-7633

ESTIMATED START	LOCATION	NUMBER OF USER TERMINALS	TRANSMISSION	TRIAL OPERATOR CONTACT
May 1981	Toronto, Montreal Calgary	700	Broadcast	Marius Morais, Telidon Project, CBC, 18th Floor, 1400 Dorchester Boulevard East, P.O. Box 6000, Montreal, Quebec, H3C 3A8, Tel (514) 285-2614
Fall 1981-phase 1 Spring 1982-phase 2	Montreal, Quebec	250	ph. 1) Teletext-cable ph. 2) Videotex-coaxial cable	Michel Dufresne, Telidon 2, Telecable-Videotron, 90 Beaubien Street West, 6th Floor, Montreal, Quebec, H2S 1V7, Te. (514) 270-6031
April 1981	Saint John New Brunswick	45	Dedicated Telephone Circuit	J. MacFarlane, Project Mercury, Project Manager, New Brunswick Telephone Company, P.O. Box 1430, St. John, N.B., E2L 4K2, Tel. (506) 693-6719
Early 1982	Nova Scotia	TBA	TBA	Denis Connor, Maritime Tel and Tel Trial, Maritime Telephone and Telegraph Co. Ltd., Maritime Centre, P.O. Box 880, Halifax, Nova Scotia, Tel. (902) 421-5855
TELIDON COMMERCIAL SERVICE				
May 1981	Southern Manitoba	50	Dedicated Telephone Circuit	Ron Larocque, Project Grassroots, Marketing Representative, Infomart, 1661 Portage Avenue, Avenue, Suite 511, Winnipeg, Manitoba, T3J 3T7 Tel. (204) 772-9453
TASK FORCE ON SERVICE TO THE PUBLIC AND TELIDON PROJECT SUPPORTING THE EXPERIMENTAL SERVICE BUREAUS OF DEPARTMENT OF SUPPLY AND SERVICES				
April 1981	Across Canada	20	Telephone Circuit	Mance Carbery, Task Force Office, 5th Floor, Journal Tower South, 365 Laurier Avenue West, Ottawa, Ontario, K1A 0S5, Tel. (613) 996-0131

ESTIMATED START	LOCATION	NUMBER OF USER TERMINALS	TRANSMISSION	TRIAL OPERATOR CONTACT
		TELIDON SYSTEMS: CURRENT AND PLANNED: INTERNATIONAL		
Early 1981	Caracas, Venezuela	25	Telephone Circuit	John B. McLean, Infomart, 122 St. Patrick Street, Toronto, Ontario, M5T 2X8, Tel. (416) 598-4000
Summer 1981	International	TBA	TBA	Fred Mercer, Teleglobe Telidon Project, Teleglobe Canada, 6805 Sherbrooke Street West, Montreal, Quebec, H3A 2S4, Tel. (514) 281-5735
May 1981	Washington, D.C.	60	Broadcast teletext via PBS station WETA	Red urns, WETA/AMC Teletext Trial, Alternate Media Centre, NYU, 725 Broadway, 4th floor, New York, NY, 10003, Tel. (212) 598-2852
Late 1981	Los Angeles, California	200	Videotex via telephone and two-way cable	L.T. Pfister, Times-Mirror Project, Telidon Videotex Systems, Suite 400, Three Landmark Square, Stanford, Conn., 06901, Tel. (203) 965-1981
Late 1981	TBA	TBA	Multi-channel teletext satellite and cable	Michael Luftman, Time-Life Trial, Time Inc. Video Group, Information Office, Time & Life Building, Rockefeller Centre, New York, NY, 10020 Tel. (212) 841-2515

TELIDON DEMO SITES

CONTACT	
MONCTON	- Angela Bourgeois, Department of Communications, Terminal Plaza Building, 7th Floor, 1222 Main Street, P.O. Box 1290, Moncton, New Brunswick, E1C 8P9, Tel. (506) 388-6505.
QUEBEC	- Paul Perry, Bell Canada, for information on VISTA demonstrations at Hull, Quebec, Montreal, and Toronto. 25 Eddy St., Hull, Quebec, J8Y 6N4, Tel. (819) 776-7633

CONTACT	
HULL	- Paul Perry, Bell Canada, for information on VISTA demonstrations at Hull, Quebec, Montreal, & Toronto, 25 Eddy Street, Hull, Quebec, J8Y 6N4, Tel. (819) 776-7633.
TORONTO	- Neil Naft, Department of Communications, 55 St. Clair Street East, 9th Floor, Toronto, Ontario, M4T 1M2 Tel. (416) 966-6331

MONTREAL - Denis Lachance, Department of Communications, 2085 Union Avenue, Montreal, Quebec, H3A 2C3, Tel. (514) 283-7737.

MONTREAL - Paul Perry, Bell Canada, for information on VISTA demonstrations at Hull, Quebec, Montreal, and Toronto. 25 Eddy St., Hull, Quebec, J8Y 6N4, Tel. (819) 776-7633

OTTAWA - Helen Rogers, Department of Communications, Telidon Program Office, Room 2000, Journal Tower South, 300 Slater Street, Ottawa, Ontario, Tel. (613) 996-4243

TORONTO - Paul Perry, Bell Canada, for informtion on VISTA demonstrations at Hull, Quebec, Montreal, & Toronto, 25 Eddy St., Hull Quebec, J8Y 6N4, Tel. (819) 776-7633.

WINNIPEG - John Crozier, Department of Communications, Room 200, 386 Broadway, Winnipeg, Manitoba, R3C 3Y9, Tel. (204) 949-4394.

VANCOUVER - Stan Dzuba, Department of Communications, Room 300, 325 Granville Street, Vancouver, B.C., V6C 1S5, Tel. (604) 544-3252.

ZURICH - John B. McLean, Infomart, for information on Zurich Switzerland, 122 St. Patrick Str. Toronto, Ont., M5T 2X8, Tel. (416) 598-4000